

THE IRON AGE

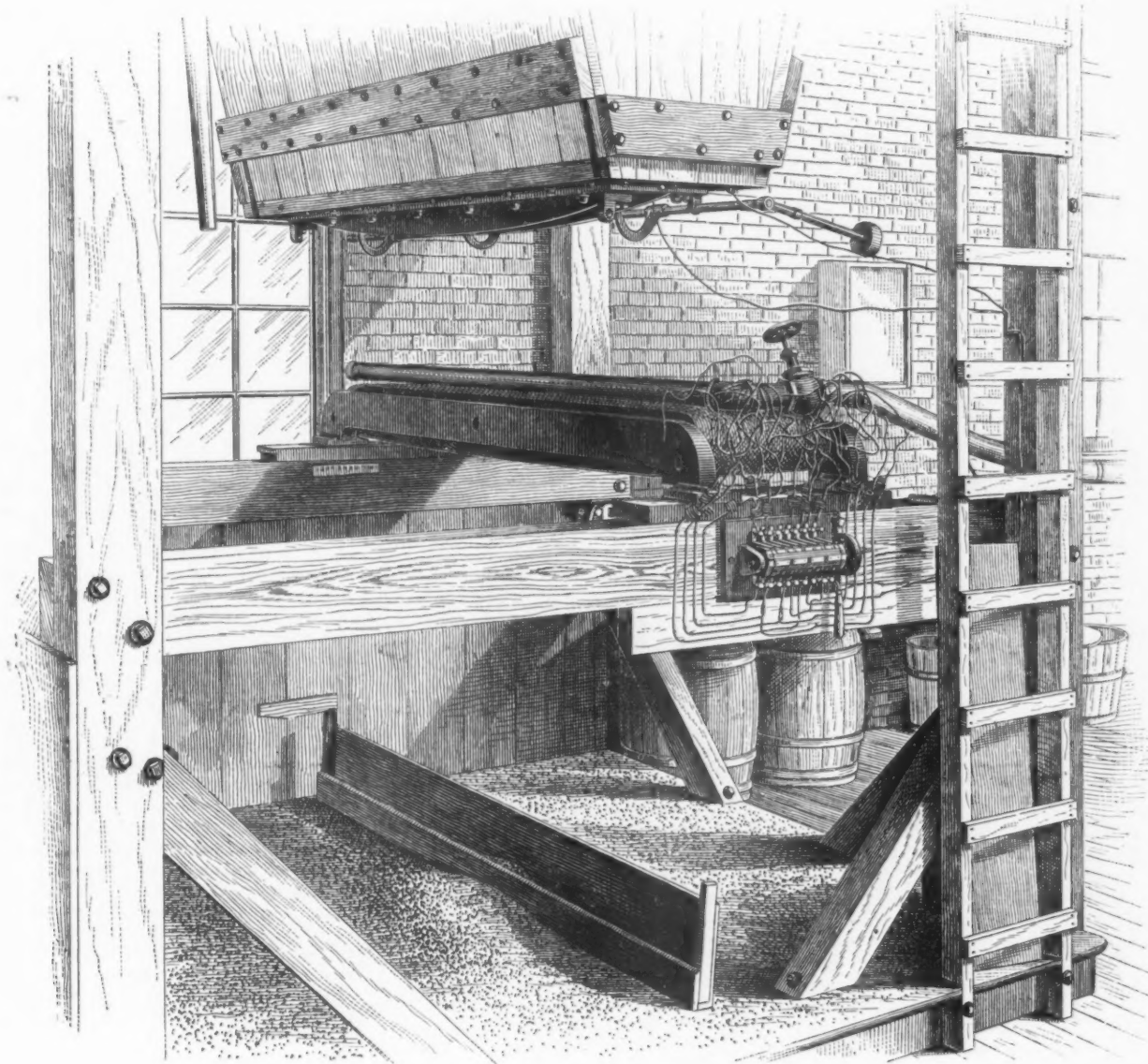
THURSDAY, DECEMBER 6, 1888.

The Edison Magnetic Separator.

After a series of experiments conducted over a considerable period, T. A. Edison has developed the magnetic separator invented by him into a practical machine. The principle upon which it is based is extremely simple, consisting, as it does, of deflecting by a powerful magnet those particles in a mixture of ore and gangue which are magnetic in their fall by

tograph was taken a number of minor changes have been made without affecting the general design. The ore which is first crushed and screened (this part of the apparatus not being shown in our engraving) is delivered by a bucket elevator into the hopper, shown in part in our engraving. In the bottom of this hopper is a long slit, which can be closed by a sharp-edged casting, balanced by the counter-weight shown. Below the hopper is mount-

on either side of the projection to the floor of the line of the slot in the hopper, a slender, movable partition is placed in position on the floor. Now, there exists a narrow zone within which those particles collect which are only very slightly deflected particles of gangue, to which a minute speck of magnetite may adhere. In order to collect this material separately the partition is made in the form of a narrow box, which has been facetiously termed



THE EDISON MAGNETIC IRON ORE SEPARATOR.

its field. The quartz or other gangue falling by the magnet are not affected by its attraction. The particles of magnetite or of magnetic oxide are diverted from the vertical sufficiently to reach the floor at a point considerably removed from that which they would attain in a free fall. Given, then, a thin sheet of ore dropping by a broad magnet, the gangue accumulates immediately below the orifice from which the sheet fell, while the magnetic particles of the ore will be found separated from it. The accompanying engraving, from a photograph of the machine now in place at Edison's laboratory, at Llewellyn Park, N. J., will clearly show how this principle has been carried out. We may state, however, that since the pho-

ed the magnet, a casting weighing 3 tons in this case, around which are wrapped a series of coils of wire. To regulate the power of the magnet, the arrangement provided is shown, by which any desired number of the coils can be arranged in multiple arc or in series. In the apparatus as now modified, this arrangement is put out of the way, being mounted on the top of the magnet instead of at the side. A dynamo furnishes a current of 25 to 30 amperes and 110 volts. Since our engraving was made a hand-wheel and screw have been added to move the magnet forward or backward, as needed, scales being provided to record its exact position. In order to separate more sharply the gangue from the ore as it accumulates

the "mugwump." Lately a scale has been attached to the floor and to the wall, in order to facilitate the recording of the exact position of the "mugwump." Immediately above the magnet is a pipe with a series of perforations, through which jets of air, supplied by a fan, can be projected against the following sheet of material to be concentrated should it be considered desirable to remove the dust from the ore.

Experiments have been made on various ores with the Edison separator. Among those treated being ores from the Port Henry and Chateaugay mines, of the Lake Champlain district, and from the Croton mines in Putnam County, N. Y. The results of the separation have not been checked in every case by chemical analysis, and in

some instances the latter is not completed. We are in a position, through the courtesy of John Birkinbine, of Philadelphia, consulting engineer of T. A. Edison, to place the following data before the readers of *The Iron Age*.

Witherbee, Sherman & Co., of Port Henry, N. Y., have had a number of separations made of two classes of ore which their mines produce—viz., the "New Bed Lean" and the "Old Bed Ore." The former is within the Bessemer limit as to phosphorus, but it is a part of the material mined with the richer ore of the vein. The object of the separation would be to remove the silica, which is present in so large a quantity as to prevent the advantageous shipment of the ore to the furnaces. The following analyses shows that the result is satisfactory, so far as the quality is concerned:

Separation of New Bed Lean Ore, Port Henry.

	Crude ore.	Concentrates.	Tailings.
A. Crushed to 20 mesh.....	Iron... 53.20 Phos... 0.03	69.90 0.01	7.67 0.08
B. Crushed to 10 mesh.....	Iron... 51.60 Phos... 0.025	70.00 0.018	7.80 0.41
C. Above 10 mesh.....	Iron... 52.20 Phos... 0.032	66.80 0.013	18.70 0.085

The Old Bed ore is rich in iron, but it is also high in phosphorus, and the experiments were made to determine to what extent phosphorus can be removed by magnetic separation, that element being present in the ore in the form of crystals of apatite.

Separation of Old Bed Ore, Port Henry.

	Crude ore.	Concentrates.	Tailings.
Iron.....	59.5	69.15	7.10
Phosphorus.....	1.77	0.41	11.06
Iron.....	62.0	70.90	9.25
Phosphorus.....	1.46	0.18	10.54
Iron.....	64.20	71.20	9.00
Phosphorus.....	1.39	0.31	11.57

It will be observed that while a considerable proportion of the phosphorus has been eliminated it is still above the Bessemer limit. When it is considered how quickly a few stray crystals of apatite will affect the result the delicacy of the operation of removing the phosphorus will be appreciated.

The following result was obtained in a test of ore from the waste dump of the Croton mine, Putnam County, N. Y.:

Separation of Croton Ore.

	Crude ore.	Concentrates.	Tailings.
Iron.....	37.97	64.72	11.04
Phosphorus.....	0.38	0.10	0.97

So far as we know the tests thus far have not been carried out by weighing concentrates and tailings produced by running through large quantities. It may be well, however, to call attention to the fact that a high percentage of iron in the tailings does not imply a heavy loss of metal. A simple computation will prove this. Thus, in the case of sample A of Port Henry, New Bed Lean, if there were no waste, the loss of iron represented by tailings carrying 7.67 per cent. would be only 3.86 pounds in 100 pounds of the metal contained in the original ore.

Mr. Edison has not, however, confined himself to magnetites. He has experimented with roasting non-magnetic ores, in order to first convert its oxide into the magnetic oxide, and then putting it through his machine. The possibilities of handling titaniferous ores have also been taken into consideration. One of his machines is now being put up in Michigan, and others have been ordered.

Light, Heat and Power reports that the new holder built by R. D. Wood & Co., of this city, for the Peoples Gas Light and Coke Company, of Chicago, has been finished and accepted by the company. The history of this holder is somewhat peculiar. It has a capacity of about 3,100,000 feet, covers about seven-tenths of an acre, and has been entirely finished within five months of the time it was started. The

contract signed by the builders called for the completion of two-thirds of the holder this month. The builders have delivered the holder fully finished, complete in all details, and in working condition, ten days in advance of the time set for the finishing of the two-thirds. The pressures on this holder are forty-four, sixty-five and eighty-six tenths, respectively, with air.

The Bartlett Water Supply Scheme.

J. R. Bartlett has addressed to the Commissioners of the Sinking Fund of New York a communication from which we extract the following:

I respectfully call your attention to the great need of this city for an additional supply of water for domestic use, sanitary purposes and for the requirements of commerce and manufactures, and herewith submit for your consideration a proposition to furnish from some sources independent of the Croton water-shed an ample quantity of pure and wholesome water, not less than 50,000,000 gallons daily, or such larger quantity as may be desired to meet these demands, delivered under pressure, into the lower part of the city, from the storage reservoirs and sources of supply of the Society for Establishing Useful Manufactures, of the Lehigh Valley Railroad Company, lessees of the Morris Canal and Banking Company, and of the West Milford Water Storage Company, the Montclair Water Company, and other companies, and from the sources of the Passaic River and tributaries, and from Rockland and Orange Counties in the State of New York, all west of the Hudson River, a region adapted by nature to supply water in ample quantity and of unexceptionable quality, and the reservoirs of the West Milford Water Storage Company and of the Montclair Water Company are situated within convenient reach of New York, and at elevations sufficient to secure the requisite head pressure. The above sources of supply are known to be ample to meet all of the requirements of the cities of Northern New Jersey, and to leave a surplus applicable to your needs. These waters will be conducted in pipes or in a permanently constructed aqueduct to the Jersey City shore of the Hudson River, under which, through a tunnel, the water will be conducted in suitable pipes of ample strength to secure absolute safety, guaranteeing a continuous flow of the waters required under a head pressure of at least 300 feet, delivered at such a point on the west side of the lower part of the city of New York as your honorable board may determine, within three years from date of contract, at the price of \$75 per 1,000,000 gallons, payable quarter-yearly after delivery shall have commenced. In this plan all Interstate questions are avoided, all riparian rights protected, and the waters from the sources mentioned will be in addition to the ample quantities provided for all the cities and towns in New Jersey dependent upon the Passaic watershed for their supplies.

It is difficult, says *Engineering*, to measure the total resistance of a large battery of accumulators owing to the smallness of this resistance and the high electromotive force of the battery. J. D. Dallas has, however, pointed out a method of overcoming these difficulties by coupling up the battery when composed of an odd number of cells, so as to form two batteries, one consisting of $\frac{n+1}{2}$ cells, and the other of $\frac{n-1}{2}$. The resultant electromotive force is then that due to a single cell, and the resistance can easily be determined.

Endless Rope Hoist for Shafts.

At the last meeting of the Engineers Club of Philadelphia, a description was presented by A. H. Storrs of Poore's endless rope hoist for shafts.

This system of hoisting is said to be particularly applicable to shafts of great depth. The advantages claimed are that it enables smaller engines to do the work, and effects a saving, as against the ordinary engines with drums, of about 50 per cent. in the first cost of the plant, and greatly decreases the running expenses, owing to the much smaller steam consumption; the ropes, working altogether in straight lines, should be longer lived; and worn out hoisting ropes can be used for tail ropes; the cages run with less oscillation, the length of the rope is easily adjusted; and there is decreased danger of overwinding. The plant, as put in at the Neilson Colliery of J. Langdon & Co., Inc., consists of a pair of 28 x 60-inch horizontal engines, with a pair of wood-faced rope sheaves and brake wheel, all 14 feet in diameter, placed on the crank shaft. In addition to the regular brake for controlling the engines, an extra brake is provided with which the engineer can clamp the hoisting rope into the grooves of the engine sheaves in case of an emergency, such as the breaking of a rope. The tower head sheaves are 12 feet in diameter.

The hoisting rope is made of special steel, $1\frac{1}{4}$ inch in diameter, with a hemp center, and runs from one cage over the head sheave to one of the engine sheaves, thence to and around a transfer sheave to the other engine sheave, and over the other head sheave to the other cage. The cages are also connected by an $1\frac{1}{4}$ inch iron wire tail rope, running from the bottom of one cage around a small sump sheave at the bottom of the shaft and to the bottom of the other cage. This sump sheave hangs in the bight of the tail rope, and is free to move on vertical guides. The transfer sheave, before mentioned, is a wrought spoke wheel about 16 feet in diameter, so set that it can be moved toward, or away from, the engine sheaves, thus adjusting the length of the rope, and its position is always such that the lines of pull of the ropes are tangents both to itself and to the engine sheaves, thus avoiding any side wear on the grooves or rope. The total hoist is about 1330 feet. The cages weigh 3 tons each and an empty car about $1\frac{1}{2}$ tons. The cars carry from $2\frac{1}{2}$ to 3 tons of coal or rock. The cages, cars and ropes being perfectly balanced, the load in the car and the friction of the machinery is all that the engines have to overcome, and, as this load is constant all through the hoist, a steadier engine speed is obtained than with drums.

A torpedo boat may be pierced in several places at or below the water line, and yet flotation may be secured by moving at a high speed. This has been proved by an interesting experiment tried by the English builders, Messrs. Thornycroft & Co., in a new boat. A hole of $\frac{3}{4}$ inch diameter was made in the side, about 1 foot under water, and when the boat was at rest the water flowed in very rapidly, but when moving at a speed greater than 10 knots per hour a skin of water was drawn over the hole, which resisted any inflow.

A natural gas vein of great power was penetrated on the 26th ult., at a point nine miles northeast of Tuscola, Ill., in the Champaign district. A well, which was being bored for water, had reached a depth of 367 feet, when water and rocks were forced out of it high in the air. A pipe was inserted and the gas ignited, the resulting flame being 30 feet high.

Arch Presses for Sub-Pressing.

The manufacture of the parts of clocks, watches and other similar work by the aid of sub-presses calls for a different construction of press for working the sub-press than that ordinarily used for blanking and punching sheet metal. We illustrate on this page three different sizes of these presses, built by Messrs. Blake & Johnson, of Waterbury, Conn., including one to be worked by foot and two sizes of power presses. The larger of the power presses is designed to cut out, by the aid of the sub-press, pieces similar to clock frames from sheet metal, and make all the apertures of whatever shape that may be required in the frame, at one motion of the plunger, thus accomplishing at one stroke the work which by the old method re-

has prosecuted this work, gradually increasing the depth as the transatlantic vessels have increased in size. From 1873 to 1887 the seagoing trade of Montreal increased from 412,478 tons to 870,773, and it is expected that next year the tonnage will be upward of 1,000,000.

The Ohio River Valley.

The corn crop of the Ohio River Valley this season is one of the largest that was ever produced, and although the heavy rains and high water have injured the quality in some localities, the yield is enormous. The valley producing corn commences about 30 miles above Louisville, Ky., and extends almost uninter-

tracted, the slop is fed to perhaps millions of cattle and hogs. Besides the corn crop of this region, on the Kentucky side is the heaviest producing tobacco district of the West.

Lying in this favored agricultural country, there is no wonder that the cities of Owensboro, Mt. Vernon, Henderson, Evansville and Paducah are flourishing. Evansville and Paducah are contiguous to one of the finest timber sections of the State of Kentucky. The former is the largest hardwood market in the West, and her manufacturing interests are furthered by cheap fuel, for the city and surrounding country are underlaid with coal, which is delivered at 75 cents per ton for steam purposes. Quite a number of well-known foundries and machine shops are located there, besides plow and wagon works.

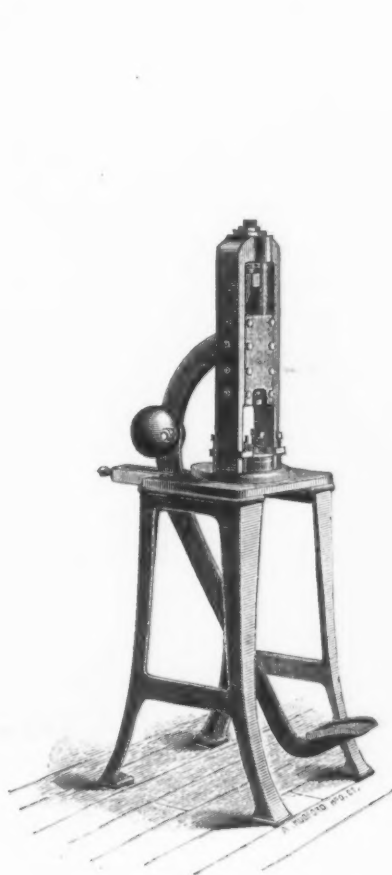
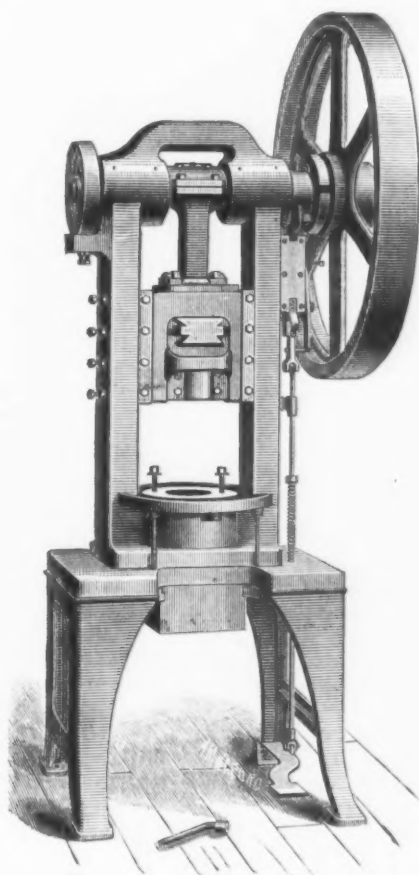


Fig. 1.—Foot Press.



Figs. 2 and 3.—Power Presses.

ARCH PRESSES FOR SUB-PRESSING, BUILT BY MESSRS. BLAKE & JOHNSON, WATERBURY, CONN.

quired several operations. The smaller power press and the foot press are designed for the smaller parts of watches that are made from sheet metal. These presses are of a form that gives to them great rigidity, which is a very important point in working sub-press. The adjustment of the plunger is accomplished by means of a wedge and screw, the wedge being carried forward or backward by the screw as may be necessary to carry the dies and punches into proper position to do their work. This device works very accurately, and admits of very close adjustment.

Blake & Johnson build eight sizes of the power presses for sub-pressing, ranging in weight from 400 pounds to 4000 pounds.

The official opening of the deepened ship channel from Montreal to Quebec took place recently. A clear water depth of 27½ feet throughout has now been secured, "except at a few points which can be finished by the time of low water next fall." For many years the Government

ruptedly on both sides of the river down to Cairo, Ill., in some places broadening out 10 miles in width on one side. For instance, the Louisville and Nashville Railroad runs on a trestle and embankment from Henderson, Ky., to Evansville, Ind., over a corn field for 10 miles. On the Wabash River, which runs between the States of Illinois and Indiana and empties into the Ohio, is probably the largest body of the great corn-producing lands; here the fields are from 15 to 25 miles wide.

Near this locality, at Mt. Vernon, Ind., is one of Hudnut's grits and hominy mills that grinds 3000 bushels of corn per day. This is supplied by a steady stream of farm wagons, the railroad, and a steamer owned by the mill and employed entirely in transporting the corn crops from up and down the river to the mill. Most of this corn along the valley is manufactured into breadstuff, starch and feed meal, at the different cities, but much of it is consumed by the distilleries of Kentucky and Illinois, where after the spirits are ex-

Henderson has a fine and most successful cotton mill, and has five or six tobacco warehouses used for stemming and packing the leaf for foreign shipment. Paducah is more pretentious. It lies at the junction of the Cumberland and Tennessee rivers with the Ohio, and is the transfer point for cargoes to and from those rivers. Within a few miles of the city, between the Cumberland and Tennessee, lie beds of fine deposits of brown ore, which, together with other attractions, such as cheap fuel, lime rock, shipping facilities, and a bonus from the city, induced St. Louis capital to erect a furnace in the city limits. The Forsman Soft Steel Company is established near by, which, if successful, will take the entire output of the furnace. This process, for which a patent has just been granted, converts any kind of melted iron, regardless of properties, into steel, as it runs from the furnace or cupola, into either castings or ingots for rolling. Already a rail mill is contemplated in connection.

Improved Feed-Grinding Mills.

A few months since we briefly described an improved form of feed-grinding mill made by the Foos Mfg. Company, of Springfield, Ohio. We take special pleasure, therefore, in presenting in this issue engravings which more clearly explain the main features of the design.

Of the illustrations on this page Figs. 1 and 2 show a mill divided at the shaft and the upper part raised, so that the inside can be seen. This is done by simply removing two nuts. The ease of access to the working parts of the mill for examination will be of interest to all considering

The crusher or conveyer on the main shaft is represented at M, and is shown in detail in Fig. 4. The crusher A is cast with a recess in one of the lugs, B, from the inside, into which is dropped the head of a bolt, C, long enough to extend clear through the hub of the running plate head D. It is then fastened securely in place by a nut which is held in place (so it cannot possibly work loose) by one of the company's own nut locks. The crusher is locked to the running head by a tenon on the end of the crusher, engaging with one on the head. Thus the crusher cannot move around on the shaft, nor backward or forward, but is held firmly in place. It

It will sometimes happen, however, that pieces of iron will get into a mill too large to work through the crusher box to the plates, so that before the pin breaker gets an opportunity to act the damage is done. To prevent accidents of this kind a safety bottom is provided. This is shown in Fig. 5. The lower case or main frame A A is cast without any bottom. At the point directly under the crusher B on the shaft is a separate casting or bottom, C, which fits closely and tightly in the space left in the lower case; and this is held in place by a bar or lever, D, hung at each end on bolts E E. These bolts are drawn up so that the bar holds the casting or

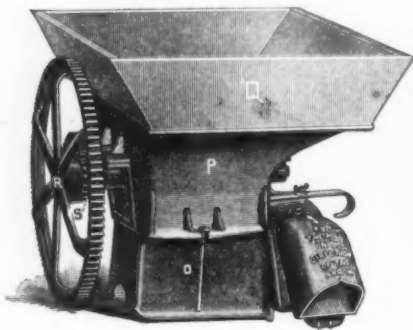


Fig. 1.—View of Hopper Arrangement.

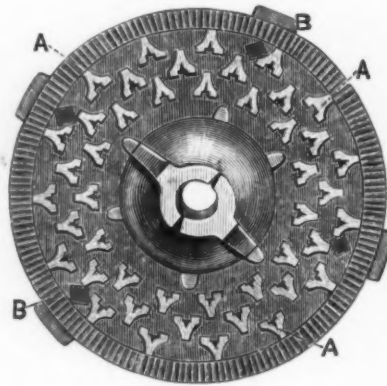


Fig. 3.—Grinding Plates.

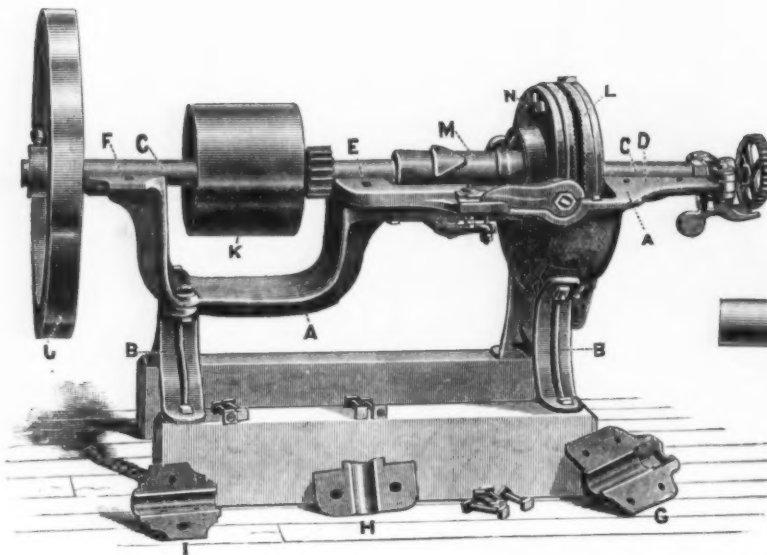


Fig. 2.—General View of Mill.

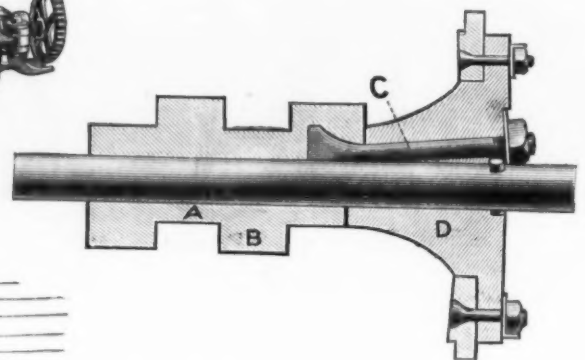


Fig. 4.—The Crusher.

GRINDING MILL, BUILT BY THE FOOS MFG. COMPANY, SPRINGFIELD, OHIO.

the purchase of such a machine. The lower case or main frame A of the mill is made in one continuous casting. The legs B B, upon which it rests, and to which it is securely bolted, are heavy castings. The shaft C is of cold-rolled steel, and of ample size in each mill to carry the largest pulleys and belts which may be desired. It runs on three long bearings, D E F, all in the single casting or main frame, so that these bearing are always in line. The journals are all made in half boxes, and can easily be adjusted when any wear occurs. All the bearings are babbitted, and will run for years before wearing out. The fly-wheel, pulley and running head J, K, L, respectively, are each carefully balanced separately before being put on the shaft. The fly-wheel is of special design, and turned on the face and both sides.

can, however, be easily removed if desired. Nuts, bolts or set screws are thus dispensed with inside the crusher-box, and cannot work loose and get into the plates.

While every precaution is taken to guard against pieces of iron or other dangerous material getting into the mill, an accident of this kind may happen. To avoid any serious breakage, therefore, the makers use a pin breaker, which consists of a wooden connecting pin in the yoke holding the temper screw. Any hard substance, as a nail or spike, coming between the plates will break this pin, the yoke and screw will be thrown to one side, thus relieving the pressure on plates, which will separate as shown, and the nail or other article will drop below and can be removed at lower spout. A new pin can be put in the yoke and the mill is again ready for work. This device has proved very efficient.

bottom firmly in place. The bar is sufficiently strong for all kinds of grinding, or any legitimate work, but should any piece of iron or other substance, as shown at G, too hard to grind get into the mill it will cause the bar to break at the point F, where it bears against the bottom (as that is the weakest point), when the casting or bottom will fall out, as shown by dotted lines. No damage is done to the mill, and the casting can be replaced in a moment by using another bar, a number of which are furnished with each mill. The value of these two features will be readily appreciated.

Returning to Fig. 2 we would explain that to the still head N and the running head L are bolted the grinding plates. One set of these are shown in Fig. 3. It will be noticed that the plan is that of gradual reduction. First, there are large

ribs on the running plates, close around the shaft, which lack less than $\frac{1}{4}$ inch of coming in contact with corresponding ribs on the still plate. These ribs engage the grain, small pieces of cob, &c., which have been broken by a breaker, and further reduced by the crusher or conveyor on shaft, and reduce them to small, uniform pieces, so that a large per cent. of the work, fully one-half, is done close to the shaft within a radius of about $2\frac{1}{2}$ to 3 inches. Then come numerous small (A-like figures) A, which stand nearly $\frac{1}{4}$ inch above the surface of the plates. These have sharp edges and cut the small pieces of grain, &c., as they pass from one to the other. Then comes a ring of fine reversed inclines, B B, extending entirely around the outer edge of both running and still plate. These take the grain, now reduced to small, gritty particles, and by rubbing reduce a portion of the product to a soft, floury meal. The metal used for the grinding plates is a special mixture of great hardness. The A-shaped figures, as

are thrown or shoveled into the hopper, and upon the double breakers, the entire length of which engages the ears, keeping them in constant motion or agitation, so they cannot clog or bridge over. The broken pieces of cobs and grain pass to the crusher on the main shaft, where they are still further reduced, as already explained, and conveyed to the plates to be ground to the desired fineness. The large slide is used to regulate amount of crushed cobs to be ground.

Heating Coke Ovens by Natural Gas.

From a recent issue of the *Pittsburgh Times* we take the following:

The experiment of heating coke ovens by natural gas has been tried in the Connellsville region with success. The Central Connellsville Coke Company, supplied by the Southwest Natural Gas Company, has used it for some time and is satisfied with the results. The Walston Company,

ovens which did not work regularly. For a set of, say 100, ovens which were kept in constant fire no lighting apparatus was needed, and, as far as the first drawing is concerned, the $3\frac{1}{2}$ tons per oven which are fit for blast furnaces would not entail any serious loss. The gas-lighting project is a good thing, but too much of a good thing for coke producers with a steady business to indulge in.

The Kansas City Foundry and Machine Company.

The Kansas City Foundry and Machine Company, of Kansas City, Mo., have within the past month opened their new works at Manchester, a manufacturing suburb of Kansas City. They are located in the beautiful Blue Valley, through which pass the Southwestern branch of the Missouri Pacific Railway and the Kansas City and Southern Railway. They are in close proximity to the Kansas City Switch and Frog Works, the new shops of the Cookson Iron Works and the Mid-Continent Boiler Works.

The buildings are constructed wholly of brick, with trussed roofs, and all are one story in height. Twenty men are now employed in the foundry, and about the same number in the machine shop. The machine-shop engine is a center crank, of 35 horse-power, built by T. M. Nagle, of Erie, Pa. The foundry engine is a 20 horse-power upright. The boiler capacity of the works is 130 horse-power, furnishing steam not only for their own purposes, but also for the Cookson Iron Works and the Mid-Continent Boiler Works. The melting capacity of the foundry cupola is 10 tons.

The company was incorporated May 28, 1888, and the buildings were completed August 1. F. B. Ray is president, T. C. Bradley is vice-president, and the foundry department is under the management of George Hurley, for many years foreman of David Creswell's foundry, in Philadelphia. The foundry is adapted to the production of both heavy and light castings, while the machine shop is specially fitted for manufacturing hardware specialties, novelty work, &c. The company are meeting with encouraging success in the demand for their iron, bronze and brass castings, making a specialty of light gray iron castings. They are sole manufacturers of the Lightning nail puller, Noiseless nail puller, and make the Fleming door hanger for the Fleming Door Hanger Company, of Kansas City.

There has been considerable controversy as to whether the Lash open-hearth furnace, which has been giving such excellent results in the Pittsburgh district, where natural gas is used, would work satisfactorily with the dirty producer gas as ordinarily manufactured in Siemens or Wellman gas producers. This question seems to have been fully demonstrated and finally settled to the entire satisfaction of all parties concerned by the results obtained at the works of the Standard Steel Casting Company, at Thurlow, Pa., who have a 20-ton furnace of this type, the gas for which is supplied by four Wellman producers. The items of labor, fuel and repairs are very much less than in the old form of open-hearth furnace, and the many advantages of the Lash furnace that have been demonstrated in working with natural gas as fuel have been carried out in the same degree in the case of producer gas. In a letter lately received by Messrs. Lean & Blair, Pittsburgh, the builders of the furnace, the Standard Steel Casting Company state that the 20-ton Lash steel melting furnace which has been in operation for several months past is giving them good results, and they are satisfied with the working of it on producer gas.

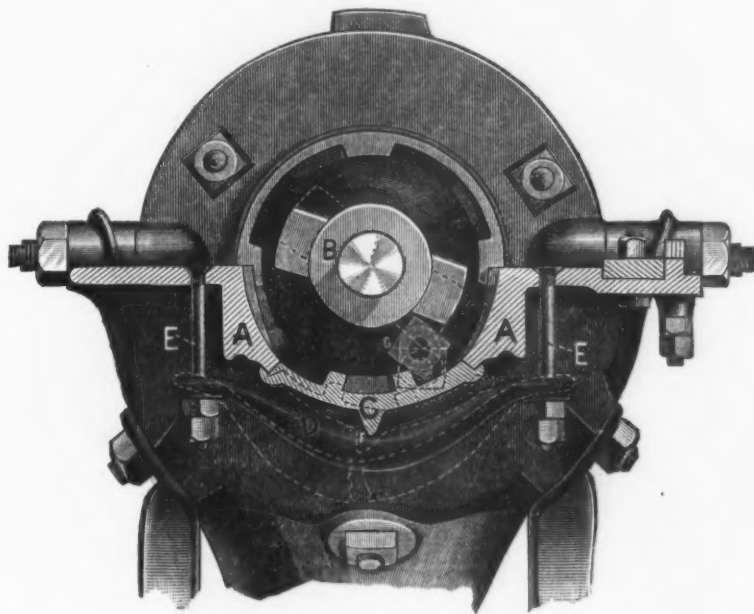


Fig. 5.—Safety Bottom.

GRINDING MILL, BUILT BY THE FOOS MFG. CO., SPRINGFIELD, OHIO.

will be readily understood, must wear to the surface before becoming useless. The figures are alike on both sides, and when one side is used in grinding, the other side remains untouched, so that when one side becomes worn the mill can be run in the opposite direction, which is merely done by crossing the belt, changing the spout and gear wheel, and the other side of the figures, which are not worn in the least, is used, thus furnishing a fresh, new surface; and as these are used the action of the grain, it is claimed, sharpens the dull side. The plates are thus self-sharpening.

Suitable adjustments are provided for the plates in case of changing them, and for regulating for fine or coarse grinding. These are simple and easily made.

We should refer also to the double breakers with which each mill is fitted. These breakers, which are at the bottom of the feed-hopper of each mill, consist of two intergeared crushers, receiving motion direct from the main shaft by a gear-wheel, causing them to revolve toward each other. These crushers have fingers or lugs which catch the ears of corn and break the cobs in pieces. Directly under these breakers or crushers, and between them and the crusher on the main shaft, is a large slide which can be moved back and forth. The ears of corn

in Jefferson County, also tried the experiment about ten days ago and is satisfied with the results. The theory of the experiment is that by using wood to start the fire time for warming up a cold oven is much longer and the first drawing of coke is of an inferior quality. From the first results of the natural gas experiment, which gives first-class coke on the primary drawing, the idea has gained ground that the natural gas as a kindling will be universally adopted. A number of coke men expressed opinions on the subject yesterday, and the feeling was that the expense of the fixtures would be more than could be repaid by the improved quality of the first drawing. A representative of the H. C. Frick Company said that he knew the first drawing of the ovens lit with wood or coal was of an inferior grade, but that it could be used in blast furnaces. If any one who understood the practical working of ovens would think for a moment, they would see that they might run for two years continually, then perhaps lay off for anywhere from one to six months. Now, a gas fixture that can only be used once in two and one-half years would be rather an encumbrance. Some temporary provision might be made in the shape of a rubber pipe and burner, with fixtures which might be a good thing for

Improved Cable Railway Machinery.

On this and the opposite page we publish engravings of several new designs in the line of cable railway machinery, recently brought out by the Walker Mfg. Company, of Cleveland, Ohio.

A strikingly interesting piece of machinery is the 500 horse-power friction clutch coupling shown in Fig. 1. The outer member of this coupling is a plain, ordinary casting with eight arms and hub on the outside secured to the shaft. The inner member has a boss or center with four bored arms into which are fitted seg-

ments of the spring to force the segments toward the center of the shaft would have to be overcome by the wedges. The coupling is very effective and is doing good service at the Eighteenth Street Power House, in Kansas City, Mo. The sleeve is operated by a yoke and lever with worm and wheel and hand-wheel.

In Fig. 2 is shown a U frame and staggered arm-sheave. The U frame is cast in two pieces, so as to mold easily, and is hollow, with flanges in the center to bolt each half together. It also has ribs inside. The flanges form a backbone to the frame when bolted together. The sides are not

be a very difficult piece of work to turn out, but we understand that the Walker Mfg. Company's system of molding reduces it to quite a simple operation.

Figs. 3 and 4 represent sections of Walker's differential cable drums. They are shown in section so as to illustrate the loose differential rings on which the cable rests while in operation. It has long been known that the destruction to cables has been largely due to the grooves wearing irregularly in the solid drums. Owing to the severe strains to which the first groove on the receiving drum is subjected as a result of the varying loads the wear is



Fig. 1.—500 H.-P. Friction Clutch Coupling.

CABLE RAILWAY MACHINERY, BUILT BY THE WALKER MFG. COMPANY, CLEVELAND, OHIO.

ments with corresponding arms. The arm part of the segments is hollow and has an inner flange on which rests a spring through which a bolt passes and draws the segments toward the center of the shaft. This spring can be adjusted so as to make the segment clear the outer member any desired amount when the coupling is not engaged. There are four wedges at the ends of segments which are forced into position by adjusting screws and toggle levers attached to the sliding sleeve as shown. When these four wedges are forced out, the result is to lift each of the four segments in a direct line with the bore of the four arms and directly in opposition to the spring inside of the segment arm. The spring is adjusted only sufficiently to keep the segments away from the outer member, as any undue pressure

pierced with holes, as is common in such castings, to get the core out when cast in one piece. These holes make such castings quite weak, especially so as the metal forming the outside of the casting is of the greatest strength. The castings are securely bolted together and dowel-pinned before they are bored and fitted for the boxes. The sheave has staggered arms, which insures great rigidity for either horizontal or vertical motion. The principal advantage of the staggered-arm sheave is a uniform casting. As the arms do not come opposite each other, all undue strains, such as occur in straight-arm castings, are dispensed with. A great many of these sheaves have already been made of 8 feet, 10 feet and 12 feet diameter, with uniform success. As the sheave appears from an ordinary standpoint of molding, it would

very excessive on this first groove in comparison with its mates in the old style drum, in which the grooves were turned directly into the solid face of the drum. It is quite evident that after the wear progressed to such an extent as to make a very great difference in the circumference of this first groove and that of its mates it would require either stretching of the cable a given amount in each revolution of the drum equal to the difference in circumference of the smaller and larger grooves or slipping in the groove, either of which would be very detrimental both to the drum and to the cable. The differential drum dispenses entirely with any wear of the grooves or any wear of the cable while on the grooves. The cable enters on the fixed ring on the leading drum, shown in the section Fig. 3, and is

wound into the left-hand ring on the end drum and then back to the second ring on the leading drum, and so forth, putting as many wraps on as may be deemed necessary according to the length of the cable. It will be seen that all the rings in the drums are loose excepting the ring on which the cable is hauled in from the street. Should there accordingly be any inequality in the diameter of the rings, whether in first construction or by subse-

solid grooved drum without slipping of the cable in the grooves. Such slipping will wear the grooves and the cable also. When the cable is at work on the differential drums each wrap between the drums appears like a solid bar of iron, and the impression of the cable is left in the tar at the bottom of rings, which shows conclusively that there is no slipping of the cable in the rings. The latter have a diametrical friction, due to the pressure of

plished without any undue strain on the cable while passing over the drums. The bottom and sides of the rings are thoroughly lubricated by automatic grease cups inserted in the rim of the drums.

These differential drums, we understand, have been thoroughly tested at the 12th and Eighteenth Street Cable Railways, of Kansas City, Mo., and the St. Louis Cable and Western Railway Company, of St. Louis, Mo., where they have been giving

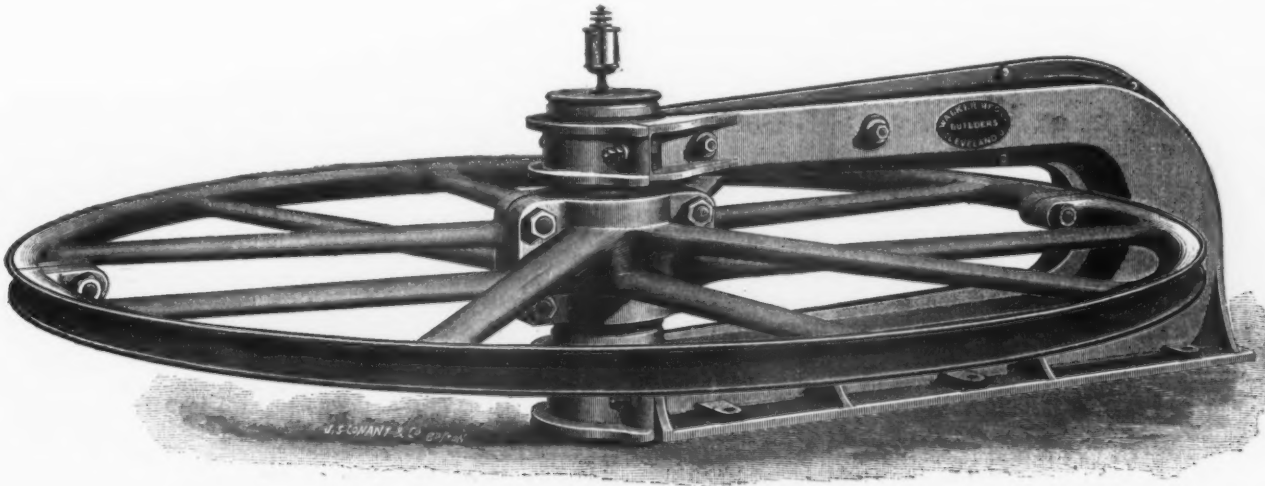


Fig. 2.—U-Frame and Sheave with Staggered Arms.

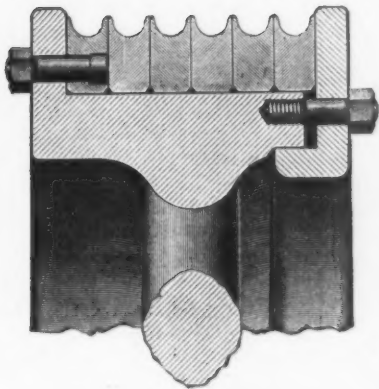


Fig. 3.—Leading Drum, Having Initial Ring Secured and 5 Loose Rings with Frictional Adjustment.

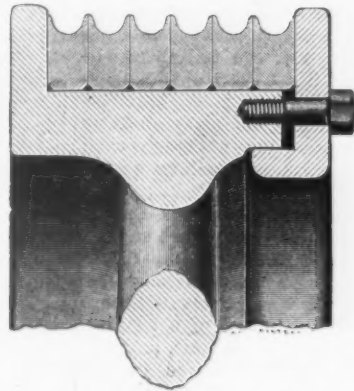


Fig. 4.—End Drum, Having 6 Loose Rings with Frictional Adjustment.

Figs. 3 and 4.—Walker's Differential Cable Drums.



Fig. 5.—Wrench for Producing and Measuring Frictional Adjustment of Rings.

CABLE RAILWAY MACHINERY, BUILT BY THE WALKER MFG. COMPANY, CLEVELAND, OHIO.

quent wear in use, the rings will adjust themselves while the drum is in action, so that there can be no undue strain on any of the wraps of the drums. The rings on which the cable rests move slightly back or forth to suit the irregularities spoken of.

A cable is hauled on the drum under greatly varying loads according to the resistance or number of cars and amount of traffic on the road. From this it will be understood that the cable is wound on the drums tightly or loosely according to the variation of load. While the cable is passing around the drums the tendency is for these to adjust themselves or equalize the strains, which cannot be done on a

the cable in the grooves, transferred to the flat surface of the drum or the underside of the rings. This combined friction of the various loose rings is sufficient, with the leading ring, which is secured, to drive the cable. However, loose side flanges are provided with side studs and a self-registering wrench in order to produce a side friction when necessary. The self-registering wrench will so adjust the studs as to produce an equal amount of friction around the entire circumference of the rings. Each individual wrap will move an individual ring with about one-fortieth ($\frac{1}{40}$) of the strength of the cable; the equalizing is thus thoroughly accom-

entire satisfaction. Other plants are being built on which these differential drums will be used.

The New York State Attorney-General, responding to the complaint of Factory Inspector Connolly that manufacturers are neglecting to educate the boys they hire, and that American boys are not being educated to trades in sufficient numbers, is clearly of opinion that a manufacturer can be held legally responsible for neglecting to train a child in mechanics only when that child has been made an apprentice by due forms of law. Otherwise no prosecution would be successful.

The New Burden Horseshoe Machine.

Mr. James A. Burden, president of the Burden Iron Company, of Troy, has just been granted two patents covering his new horseshoe machine, the principal features of which are described by the *Troy Times*:

The result sought to be accomplished by the mechanism shown in these two patents is the production of a finished horseshoe by a series of connected operations performed by a single machine, instead of making the shoe by one machine and finishing it by disconnected and separate operations through the functions of other apparatus. The mechanism illustrated in both the patents alluded to have, in the main, the same function, that of giving to the heated bar from which the shoes are made regular periods of motion and alternating periods of rest. In both constructions, while the bar is moving it is shaped, creased, rough-punched and swaged, and, while at its intermittent periods of rest, it is full-punched by a very ingeniously operating mechanism and is cut off into the required blank lengths. While these two patents provide for the same regular intermittent movement of the heated bar of iron, in one of them the rolls rotate continuously, while in the other the rolls themselves make a half turn as each set of them separately and in continued sequence operates upon the bar to shape, crease and rough-punch its passing blank lengths.

The machines operating the continuously moving rolls have an opposite half of their circular faces upon the latter cut away, so that as the rolls are continuously rotating the opposite halves of the roll faces will engage with the bar to move it a shoe-blank length, and when those parts of each set of rolls where cut away on their circular faces oppositely approach each other in their rotation they will pass over the bar without engaging with it, so that the rolls intermittently engage with the bar to move it a shoe-blank length at each rotation of the rolls. The operation of the shaping rolls in both styles of machines gives the required transversely sectional form to the bar by means of a shaping groove made in one of the rolls, and the plain engaging circular surface of the other of the two shaping rolls. One of the second set of rolls is grooved to receive the bar coming from the shaping rolls, and this groove of the second set of rolls has upwardly projected therefrom blades which press into the bar, at proper distances apart, the creases for the nail holes. From this latter set of rolls the bar passes to the rough-punching rolls, in which one of them is grooved and has punches upwardly projecting from the groove therein, with sinks made in the roller face of the other roll, to come radially opposite the punches as the rolls turn, so that at each rotation of this set of rolls each previously shaped and creased blank-length of the bar is in succession rough-punched for the nail holes at proper distances apart. Thus, as the bar is shaped by one set of rolls, as it is passing through the other two sets of rolls it is successively creased and rough-punched.

The full punching of the previously rough-punched shoe-blank lengths of the bar is accomplished by a very ingenious operation, which is the same in both patents. It will be understood that in doing this full punching the bar is heated, and, being so heated, the tendency is to destroy the punches after a short period of use, as they have to enter the iron and pass out from it, and to be in contact with the heated metal to an extent equal to the thickness of the bar. By Mr. Burden's method the bar as coming from the rough-punching rolls, from the operation of the latter, has nail-head depressions made therein that are conical and elliptically elongated in the direction of the sides of

the bar, which is caused by the entrance and emergence of the radially placed punches, with the metal displaced by the rough punching appearing on the opposite face of the bar as a burr or excrescence; the operation of rough-punching merely putting the nail-holes in a form to be finished punched by a second and connected operation.

While each of the successive blank lengths of the bar enters the full-punching mechanism, and, while the bar is at each of its intermittent periods of rest, the full punches are operated vertically and with great rapidity, to enter the holes previously rough punched, and to as rapidly move away from the bar in return. As the amount of metal to be punched out is very small, the punches are in contact with but little of the heated metal. To further aid the matter there are dies arranged on that face of the bar which is opposite to that at which the punches enter, and these dies have sinks that vertically align with the punches, the edge of the sinks facilitating the operation of the punches in removing the burrs or excrescences formed on the bar from the rough punching.

Mr. Burden, by his entirely new method of punching the blank lengths of the bar, overcomes all of the difficulties encountered by other experimenters, in the fact that in the operation of full-punching the punches have but very little heated metal to come in contact with, and when moving they operate so rapidly there is but little chance of their being injured. To guard against their becoming overheated, as a precaution several sets of punches are arranged so that they can alternately be brought into position. The bar, after these several operations have been completed, passes to the cutting mechanism. From the cutting mechanism the bar passes to the swaging or shaping apparatus, and as soon as the end of the bar has entered the latter, by a rapid movement of the cutting mechanism a proper blank length is cut off and caught by the swaging and shaping apparatus. The swaging or shaping mechanism of the two patents is the same in each of them, and a die-wheel having frog-form dies on its circular face is used in both of them. The form of the wheel and its frog-form dies is about the same as in the older machines invented and patented by James A. Burden, although in the two new patents this wheel has a continuous rotation, while in the older machines it was operated with alternating periods of motion and rest.

As this die-wheel rotates, the entering end of the bar is caused when in motion to pass across the face of the revolving die-wheel, and at the same instant the cutting mechanism operates to cut off from the end of the bar one of the previously shaped, creased, rough-punched and full-punched blank lengths, which latter is caught centrally on the toe-end of one of the frog-form dies on the die-wheel, and at the same time as carried around by the latter the bending and swaging levers operate to press the bar in around the frog-form die to give to the blank the requisite form of the shoe. When this has been done another roller provided with sinks, to receive each of the frog-form dies, straightens out and makes laterally true the face of the shoe, so as to remove all buckling or lateral distortion which may have occurred. This straightening out and flattening of the shoe is very ingeniously done by an eccentric face on the sink roller that is made to tangent with the shoe upon the flat base-plate of the frog-form dies, and caused to move with the same speed as the latter by having the gears operating the same, made to differentiate at intervals as to pitch. From the die-wheel the finished shoes are removed as fast as produced and carried away by conveying belts, in the usual manner.

One of the new machines is in process of construction, and some of its parts have been completed. The work will be pushed, and when the new machine is finished its capacity will be tested and other machines will be made and operated at the Burden Iron Works. The new invention will to a great extent revolutionize the manufacture of horseshoes. William E. Hagan was the attorney for Mr. Burden in securing the patent.

This summer a new horseshoe machine was completed by James A. Burden and patented by him. The machine is called the snowshoe machine, because of the style of shoe made by it. Three of these machines are completed and will be in operation in the new building at the Burden iron works in a short time. The capacity of the snowshoe machine is 30 tons of finished shoes a day—24 hours—or 52,000 shoes in round numbers. The aggregate capacity of the three machines will be 90 tons, or 156,000 horseshoes, a day. The machines have been operated in the blacksmith shop pending the completion of the new building, and they fully meet the expectations of the inventor. The new building in which the snowshoe machines are to be operated is practically completed. It is south of the present horseshoe department at the steam mill. The structure is 332 x 62 feet. The brick walls are 18 feet in height, surmounted by an iron truss roof covered with slate. A wing 100 x 60 feet connects the new department with the old horseshoe warehouse. The cost of the new building, with its full complement of machinery—which is partly placed—including a Corliss engine, three horseshoe machines, shearing machines and punching machines, is estimated at \$75,000. The capacity of the Burden Iron Company's works for turning out horseshoes will be greatly increased by the new machines about to be started, and the capacity will be still further increased when the combination machines shall be completed and operated.

Mexican Exports.—According to the *Diario Oficial*, exportations from Mexico to foreign countries during the fiscal year 1887-88 were:

To United States.....	\$31,159,626.66
England.....	10,540,965.23
France.....	4,474,723.31
Germany.....	2,177,106.09
Spain.....	457,842.02
United States of Colombia....	109,959.86
Guatemala.....	34,827.25
Belgium.....	25,583.16
Nicaragua.....	2,500.00
Costa Rica.....	2,107.80
San Salvador.....	490.00
Holland.....	100.00
Italy.....	52.00
Peru.....	25.00

Total.....\$48,885,908.38
Against, in 1886-87.....49,191,930.05

Decrease.....\$306,021.67

Of these exportations the principal ports of Mexico exported—viz.:

Vera Cruz.....	\$16,067,992.84
Paso del Norte (frontier).....	12,022,678.45
Progreso (Yucatan).....	6,468,385.08
Mazatlan.....	4,860,767.51
Laredo (frontier).....	1,215,515.04
Puxpam.....	1,094,902.71
Piedras Negras (Eagle Pass).....	874,572.62
Tampico.....	719,789.06
Matamoros.....	441,798.54
Nogales (frontier).....	691,592.95
Ensenada and Tijuana, &c., &c.....	116,245.75

The frontier ports show large increase, while nearly all the seaports show large decrease.

A Paterson silk manufacturer failed to deliver a quantity of goods previously contracted for and the defense in court was a strike in the works, which made delivery impossible. Judge Donohue ruled that the strike was not a legal excuse, and this decision was sustained on appeal to the upper court.

Coal Hopper Scale.

An exceedingly convenient and useful apparatus has just been brought out by Messrs. Riehle Brothers, of Philadelphia, Pa., and is shown on this page. It is known as the Drexel Coal Hopper Scale.

The scale has an iron or wooden hopper on it and is so arranged that it can be placed under the pavement or floor, and will accurately weigh the coal that is dumped into the hopper from the wagon or cart. The hopper can be made large enough to carry one, two, three or more tons of coal, and the scale is strong enough to allow the coal to remain on it until it is used. At the bottom of the hopper is a sliding draw plate, which can be opened by the engineer and the coal dropped into

houses where a great deal of coal is consumed, a scale of this kind will be found desirable.

Recent Treasury Decisions.**RAZOR BLANKS DUTIABLE AS RAZORS.**

The appellants claimed $2\frac{1}{2}$ cents per pound, or as manufactures of steel at 45 per cent. ad valorem, instead of 50 per cent. assessed. From the special reports of the appraiser on these appeals it appears that the articles in question are razors with blades of regular patterns and with finished handles, and that with the exception of grinding and polishing, they are ready for use. It appears, further, that similar articles were imported in 1886, and were classified as "razors," and that action was

that they were not handled, and which were ascertained to be commercially known as cutlery, were held to be dutiable as cutlery. Department's prior decision, however, of 1873, under which duty was assessed in this case, holds that certain pocket-knife blades are dutiable as manufactures of steel not otherwise provided for, and not as penknives, jackknives or pocket-knives.

It was submitted whether, in view of the appraiser's report and the principles enunciated, these goods are not dutiable as claimed by the appraiser. This would be on the theory that as these blades are known as cutlery, and as pocket-knives are also known as cutlery, therefore, these blades should be assessed with duty at the rate specially provided for pocket-knives. In the opinion of the Department, this conclusion can hardly be accepted, inasmuch as the provisions would not seem to cover articles such as these, which are only parts of pocket-knives which are commercially known and designated as cutlery. Being commercially known as cutlery they are clearly covered by the special provision therefor, as claimed by the appellants.

DUTY ON THUMB TACKS.

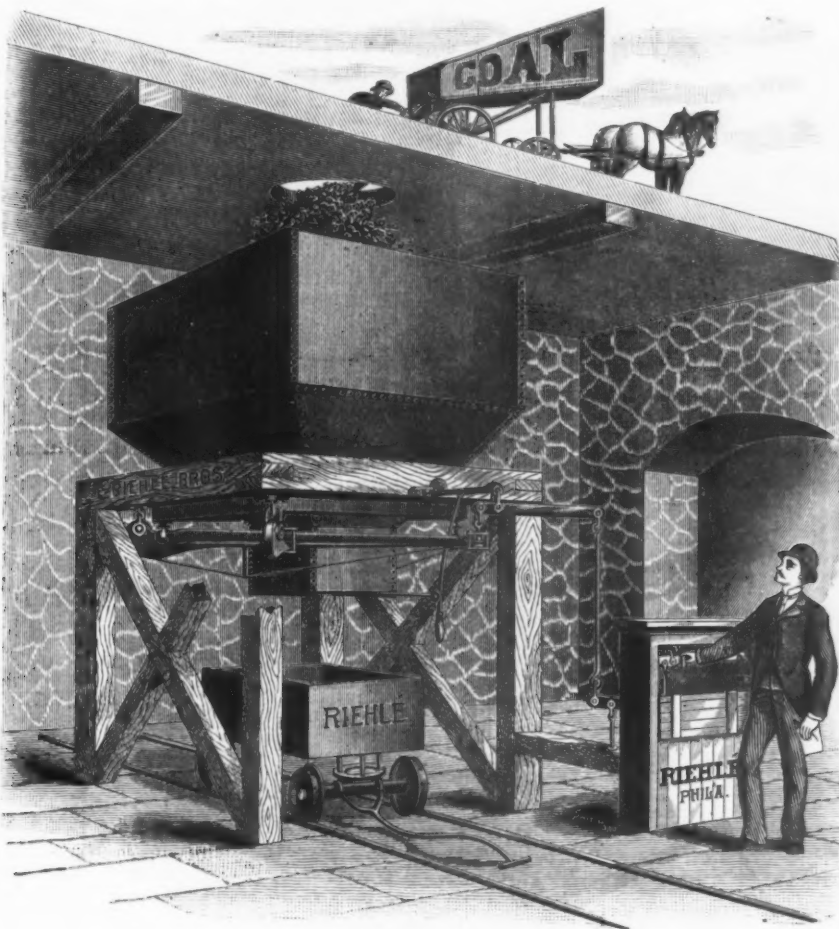
Parties having appealed from an assessment of 45 per cent. duty, claiming $2\frac{1}{2}$ cents per pound for cut tacks, the Secretary, affirming the assessment, says: "From the special report of the appraiser submitted it appears that the articles in question consist of thumb-tacks put up in boxes of one-half gross each, with a small steel instrument for pulling up the tacks after being used, and the United States Appraiser at New York, to whom the question was submitted, states that the articles are commercially known as thumb-tacks, which are generally used by artists and others to fasten, by the pressure of the thumb, the drawing paper or other material to a drawing board, and that it is his practice to classify them in accordance with the return made."

The Connellsville Coke Trade.

From present indications there will be no advance in the price of coke during the present month. The question of advancing the price to \$1.50 per ton, to take effect on the 1st inst., was thoroughly discussed by the leading operators, but it was decided that at present such a move would not be advisable. It is the general impression that the price will be advanced to \$1.50 per ton after January 1 next. The production of coke for the month just closed was the largest for the same period in the history of the Connellsville region. The estimated production for the week ending on the 24th ult. was 125,090 tons, and that for the previous week was 125,595 tons. Of the 13,955 ovens in the region 12,250 are in blast.

Within the last few weeks there have been published in the Pittsburgh papers a large number of rumors of coke deals, which, upon investigation, were found to be without truth whatever. The latest of these appeared last week and was to the effect that the McClure Coke Company and the H. C. Frick Coke Company had decided to consolidate their interests, for the purpose of waging war on the smaller operators, with the ultimate intention of driving them out of the business. We are authorized to state that there is no truth in the rumor whatever.

The Detroit Copper and Brass Rolling Mills, at Detroit, Mich., report to us that last week the works turned out the two largest sheets of copper ever rolled in this country. They were $\frac{1}{2}$ inch thick and 11 $\frac{1}{2}$ feet square, weighing 3000 pounds each when finished.



COAL HOPPER SCALE, MADE BY MESSRS. RIEHLE BROS., PHILADELPHIA, PA.

an iron car or wheelbarrow and carried to any place desired, whether to a storing bin or direct to boiler. Thus all the coal is received, weighed and moved without any handling, and, as will be readily seen, the device is excellent for guarding against incorrect or careless weighing, and for the economical distribution of coal to the places desired. The scales are made specially strong and accurate, and the levers and weighing parts all regulated to the standard of the United States, so that no dispute can occur upon that point. In case the accuracy of the scales may be questioned, the United States standard weights can be placed upon them and tested. A scale of this kind was placed in the new Hood, Bronbright & Co. building, Eleventh and Market streets, Philadelphia, some time ago, and its value and importance so well proven that one has been located in the new Drexel building, Fifth and Chestnut streets, Philadelphia. For public institutions and large ware-

affirmed by the Department. The decision assessing duty at 45 per cent. ad valorem on the merchandise covered by the present appeals is, therefore, hereby affirmed.

DUTY ON POCKET-KNIFE BLADES.

The appellants claim that pocket blades are dutiable as "cutlery" at the rate of 35 per cent. ad valorem, instead of 45 per cent. ad valorem. The appraiser reports that the merchandise consists of pocket-knife blades fully finished and ready for hafting. He further states that such articles have been commercially known and designated as "cutlery" from the date of their first manufacture, but that being complete pocket-knives, except that they are not handled, they would (but for the decision above cited), be returned for duty under the special provision for pocket-knives at the rate of 50 per cent. ad valorem.

By said decision certain table-knives and forks which were complete, except

Improved Saw Mill.

The Salem Iron Works, of Salem, N. C., are putting on the market an improved saw mill for small power, having been specially designed for farmers—for example, who have a small water or steam power, but do not care to invest in an expensive mill. It is not intended for doing a large lumbering business, or for sawing long and large logs, but for those who want a good, cheap mill for their own use and do not care to saw logs over 3 feet in diameter or 16 feet in length.

The saw frame is made of seasoned long-leaf pine, 4 inches thick by 12 inches deep, well tenoned and bolted together, and is 3 feet wide and 6½ feet long. It has a mandrel 2½ inches diameter by 4½ feet long. The cone pulley gives three changes of feed, ¼, ½ and 1 inch to each revolution of the saw, as may be required to suit the power. The carriage is 37 inches wide and 18 feet long, also made of seasoned long-leaf pine, tenoned and bolted together, having four cross pieces in each 18 feet of carriage. The timber is 4½ inches thick and 6½ inches deep. The head blocks are 3½ feet long. The knees are 19 inches high and open 30 inches from saw. The head blocks and knees weigh about 150 pounds each. The mill will carry any size saw up to 48 inches diameter, and a 6 to 10 horse-power engine and boiler will furnish enough power to do a reasonable amount of sawing.

Each mill is provided with an improved double eccentric friction feed, adjustable mandrel boxes, wedge wheel, long rest, saw guide, and enough improved conical rollers and boxes to go on ways twice the length of carriage.

Dynamite Shells.

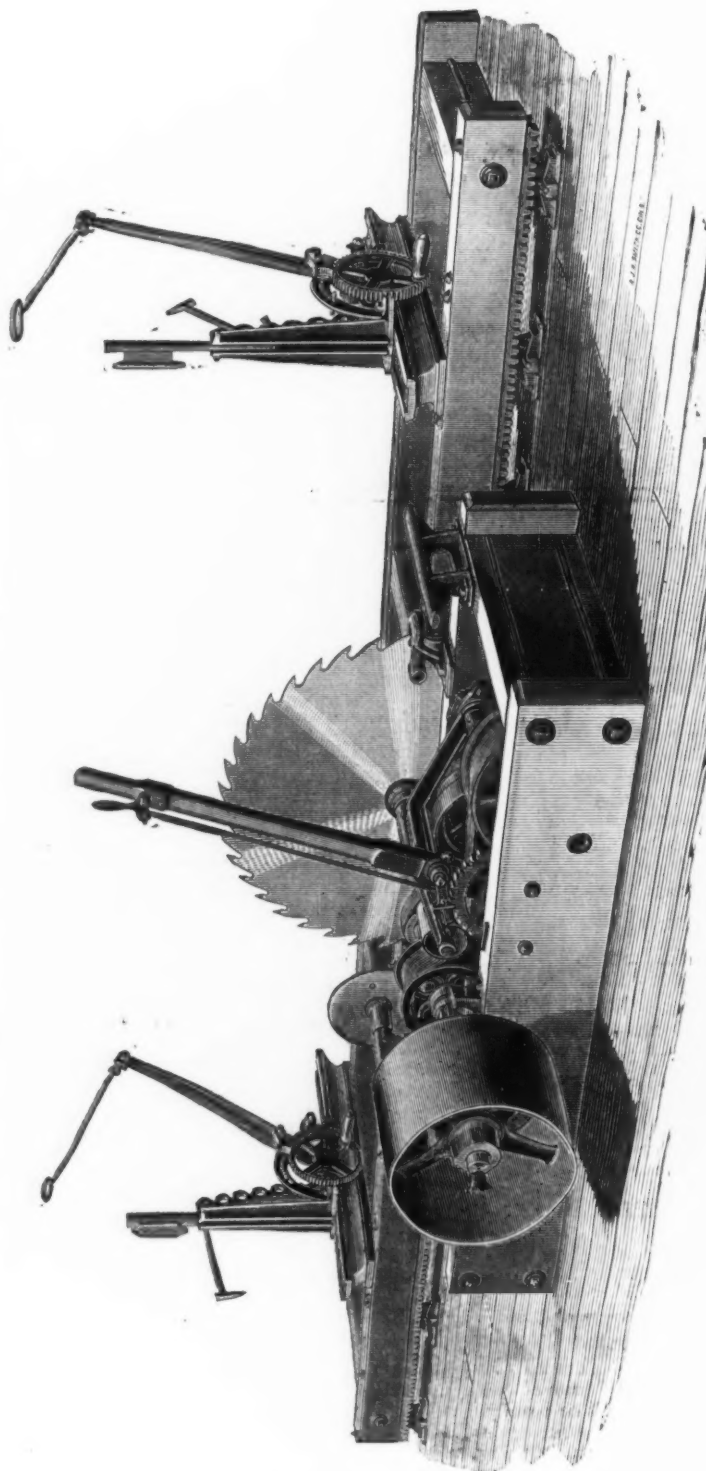
In view of the increasing attention which is given to the problem of throwing shells filled with high explosives, the results which have been obtained in this country by Lieut. James W. Graydon, late of the United States Navy, are of considerable interest. Though we have on a previous occasion referred briefly to Lieutenant Graydon's shell, we will here repeat that it is charged with dynamite and is fired out of service guns with ordinary powder. It is well known that dynamite may be exploded by a sudden concussion, and that, if it be substituted for the ordinary powder in a shell, there is a great chance of the gun being blown to pieces before the projectile can leave the muzzle. Lieutenant Graydon eludes this disposition of dynamite to explode prematurely by dividing the charge into a large number of small packets or pellets, each inclosed in an envelope of impermeable material. To still further isolate the contents of the packets, the interior of the shell is lined with a non-conducting substance, such as asbestos, and is divided into compartments by partitions. The result of the arrangement is that the nitroglycerine cannot separate from the solid matter with which it is associated, or become more concentrated in one part of it than in another; the shock of the propelling charge is also modified before it reaches the explosive, the envelopes constituting an elastic cushion which softens the blow.

The shell is provided with a percussion fuze, but to delay the explosion until the projectile has penetrated deeply into the object, against which it is aimed, the striker is seated upon a stiff spring of some length. This spring has to be fully compressed before the percussion powder is ignited, thus affording a minute fraction of time between the impact and the explosion. In this brief interval the shell can bury itself more or less deeply, bring-

ing its disruptive action to bear within the actual substance of the target. From experiments made by officers of the United States army and navy, it would appear that the method of filling shells is perfectly effectual, at least we read of no failures in the reports rendered by them to their Government. The plan is certainly simplicity itself, and, while it guards the dynamite against premature explosion,

be used with perfect safety in any gun in the service, and they all joined in recommending further experiments with the 8-inch rifle and the 15-inch smooth-bore gun.

Later trials made with a 7-inch rifle gave further highly satisfactory results. One European nation, at least, has decided that the Graydon shell is a very valuable invention. The French Government have



IMPROVED SAW MILL, BUILT BY THE SALEM IRON WORKS, SALEM, N. C.

does not seem to reduce its shattering action when it is ignited by the fuze. Three sets of trials have been made of the Graydon shells by or in the presence of United States officers. They reported that, in their opinion, Lieutenant Graydon's claim to have invented a process of so charging a shell with dynamite that it can be fired from a gun in service, with the service charge of powder, had been fully demonstrated as far as the 4½-inch gun was concerned. Two of the officers were convinced that the invention could

purchased the patent rights for their own country for the sum of \$500,000.

It is stated that the management of the Delaware, Lackawanna and Western have decided to cease using 42-inch paper wheels under their passenger equipment, and adopt the 36-inch wheel as their standard. The reason assigned is that with the 42-inch wheels they experience a good deal of trouble from the springing of axles. Their passenger car-wheels in the future will be steel tired.

An Experimental Engine for Technical Schools.

In the course of an extensive article on the Central Institution of the city and Guilds of London Technical Institute, *Engineering* describes and illustrates the experimental steam engine used in the engineering department. It appears from this that the following conditions to be fulfilled were laid down by Prof. W. C. Unwin, the director, in applying for tenders:

1. The engine must be capable of being worked as a compound expansive engine, the steam being condensed in a surface condenser.

2. Either cylinder or both cylinders together must be capable of being used as a non-condensing expansion engine.

3. With one cylinder working and without condensing it must indicate 30 indicated horse-power, with a boiler pressure of 60 pounds per square inch.

4. The steam must at will be admitted to or stopped off from the jackets of either cylinder. The condensed steam from the jackets must drain to a point where it can be drawn off for measurement.

5. The cut-off in each cylinder must be capable of being varied by hand from 20 per cent. to 60 per cent. of the stroke at least.

6. The clearance of the ends of the cylinders should be capable of being varied.

7. The intermediate reservoir between the cylinders should be as small as possible, but capable of being enlarged by a volume equal to twice the volume of the high-pressure cylinder.

8. The governor must be arranged to act on a throttle valve on the main steam-pipe. If it could also be arranged to act on an automatic cut-off to one of the cylinders it would be advantageous. Of course, when acting on the valve gear the throttle valve would be set wide open.

9. The cranks of the two cylinders must be capable of being set at right angles at 180° , and at least two other relative positions.

10. The condenser must be arranged to drain the cylinder, and the condenser and air pump must be so placed that the discharge of condensing water and of condensed steam can be delivered above the floor so as to be conveniently measured. It is very important that there should be no leakage of condensing water into the steam space of the condenser.

11. Indicator cocks are to be fitted to each end of each cylinder, and separate gear for working the indicator is to be provided for each engine. Provision to be made for attaching an indicator to the air and circulating pumps and to the intermediate steam reservoir.

The design and tender of Messrs. Marshall, Sons & Co., Limited, of Gainsborough, was finally accepted. The arrangement adopted was that of two ordinary horizontal engines placed side by side and working the same crankshaft. The high-pressure cylinder is $8\frac{1}{2}$ inches in diameter, and the low-pressure 14 inches in diameter, the stroke in each case being 21 inches. With the exception of the front covers, the cylinders have jackets all over which drain through a steam trap into a graduated tank below the floor level. Each end of each cylinder has a vertical port, which is closed by a blank flange when the engine is at work. The flange is cast with a flat plate which more or less completely fills up the port. A number of these flanges with displacing plates of different dimensions are provided so that the clearance of the engine can be varied within somewhat wide limits. Steam can be shut off from either cylinder at will, and either engine worked independently by uncoupling the connecting and eccentric rods of the other. The governing of

the engine is effected by an automatic expansion gear, in the case of the high-pressure cylinder, and by a throttle-valve in the case of the low-pressure. The throttle-valve is of the Cornish equilibrium type, fitted in the same casting as the steam stop-valve to the low-pressure cylinder. In order to be in a position to make experiments on the effect of varying the angle between the cranks, the crankshaft has been made in halves, which are connected together by a flanged sleeve. The coupling on the high-pressure side is made with six bolts, and on the low-pressure by seven, so that the cranks can be placed at 42 different angles. A rope-driving pulley has been fitted on this sleeve. In the design of the surface-condenser every precaution has been taken with the object of making it absolutely steam-tight. This point is of the utmost importance for scientific purposes, as a comparatively slight leakage may seriously affect the correct interpretation of the indicator diagrams. The circulating water enters the condenser at the top, flows down the central pipes, and up through the spaces between the inner and outer tubes, and is finally discharged into a measuring tank. The steam, of course, flows round the outer tubes. As all the joints between the tubes and the tube-plates can in this design be made by expanding the tubes, perfect tightness is secured. The air-pump discharges into a calibrated tank, and when this is full the discharge can be turned into another similar tank, while the first is emptied by opening a valve. The discharge from the circulating pump passes into another tank, and thence through a series of baffle-plates of wire gauze out through a carefully calibrated orifice, the head over which is measured by the reading of a scale carried by a float in the tank. The advantage of this method over the plan of discharging over a weir is that small errors in the determination of the head over the orifice do not affect the result to so great a degree. All these tanks are supported on the wooden stand, and each is fitted with an accurate thermometer.

The brake dynamometer is of the internally cooled type, the distinctive feature of which is that the brake-wheel rim is made trough-shaped, and into this trough a constant supply of water is introduced on one side of the wheel and skimmed off by another pipe on the other side of the wheel as it gets hot. It is intended to take 50 horse-power, but could probably absorb considerably more. The compensated gear is fitted with a spring balance, and allowance is made for the reading of this in estimating the brake horse-power. The break shaft is driven by a link from the low-pressure crank-pin, and can be entirely disconnected from the engine when not in use. The engine can be worked, as (1) compound condensing; (2) compound and non-condensing; (3) high-pressure engine only and non-condensing; (4) both engines with high-pressure steam and non-condensing; (5) low-pressure engine only and non-condensing; (6) low-pressure engine only and non-condensing.

Lean & Blair, of Pittsburgh, inform us that they have closed a contract with the Union Rolling Mill Company, of Cleveland, Ohio, for the remodeling of their blast-furnace plant, including the erection of two of their Ford & Moncur hot-blast stoves. These two stoves are to blow a furnace of 200 tons daily capacity, and it is claimed that the blast for two of the largest modern blast furnaces can easily be heated with three of these stoves, and kept at an absolutely even temperature throughout the blow, and the stoves kept perfectly clean for all time. If these claims, which are backed up by letters from many of the most prominent British iron masters who have these stoves in use,

can be substantiated, a most valuable step in the right direction has undoubtedly been made. We hope to give our readers further information on this point before long, after these stoves and those now in course of erection at Talladega, Ala., have been blown in.

Southern Pig Iron Freights.—The Queen and Crescent route via the Alabama, Great Southern and the Cincinnati Southern Railway have issued a new pig iron tariff which went into effect on the 1st of December. It shows a reduction of 20 cents a ton. The rate to Chicago is \$3.70 from Dayton and Rockwood, \$3.90 from Chattanooga, \$4.15 from Rising Fawn, Attalla, Bessemer, Birmingham, Gadsden and Wheeling, Ala.; \$3.90 from Florence and Sheffield, \$4.40 from Anniston, Clifton, Ironaton and Jenifer, Ala. To Cleveland the rates are 25 cents less than these. To Cincinnati the figures are: From Dayton and Rockwood, \$2.30; Chattanooga, \$2.40; Rising Fawn, \$2.65; Attalla, Bessemer, Birmingham and Wheeling, Ala., \$2.90, and Florence and Sheffield, \$2.65. The Kansas City rate is \$5.78 from Dayton and Rockwood and \$5.98 from the other furnaces. The St. Louis rates are \$2.95 from Rockwood and Dayton, and \$3.15 from Chattanooga, and \$3.40 for the Birmingham district.

A Buffalo man claims to have solved the problem of "harnessing" the Niagara River, for which Buffalo business men have offered a reward of \$100,000. A model of the invention exhibited in the Board of Trade shows two massive piers on each bank of the river. Heavy shafts stand up obliquely by the piers. At the bottom of the shafts an endless belt runs from shaft to shaft across the river, made of two strands of 2-inch cable. Fitted to this cable every 5 or 6 feet are sheet-iron plates, 3 x 5 feet, pivoted at one end, opening either way, but chained so that they open but a short distance. The full force of the current pressing on these plates forces the belt around at a great rate, and by ingenious arrangements the current is felt equally both going and coming. The shafts revolving drive a cable and furnish power on the banks. The inventor, Mr. Edward Suckrow, figures that 16,000 horse-power can be secured in this way.

Joseph Colby, of Milwaukee, has been elected treasurer of the Penokee and Gogebic Development Company, which owns the famous Colby mine, as also the Ashland and Tilden, on the Gogebic range. When the Colby mine was opened three years ago it was leased to Mather, Morse & Co., of Cleveland, for three years. The lease expired November 1, and the Development Company will now work it themselves. Pickands, Mather & Co. will handle the ore. Mr. Colby said in a recent interview that there had been about 750,000 tons of ore taken from the Colby, and that this amount had been taken from an area of about 20 acres. Capt. William Dickinson, an experienced mining man, has taken the superintendency of the Colby. The lessees of the mine, Mather, Morse & Co., left the mine in good working order, and work will be commenced without any delay. Mr. Colby says that there are a number of other properties on the Gogebic range that were closed when the collapse came that it will pay to invest money in, as soon as they can be gotten out from under the present burdens of litigation.

The first cotton mill erected in Iowa was put in operation at Des Moines on the 26th ult., with interesting ceremonies. The factory has a daily capacity of 10,000 yards.

Compressed Air for Power Transmission.

Prof. W. C. Unwin recently contributed to the transactions of the British Institute of Civil Engineers a paper on conveying power by compressed air, with the aim of stating in a simple form the laws governing such power transmission. From it we quote as follows:

In examining some of the calculations on which schemes for compressed air have been based it appeared that they were unnecessarily tentative and cumbrous. In one not unimportant respect calculations about the transmission of power by air appeared to be based on a wrong principle. By analogy with the transmission of power by water it has been tacitly assumed that the frictional work in the mains is entirely wasted work. But with air it is not so. Under practically realizable conditions the whole of the frictional work in the mains may be expended in heating and expanding the air. What the air loses in pressure it gains in volume. The fall of pressure does involve a loss in transmission, because the efficiency of the pump or of the motor is affected. But in spite of this secondary loss an advantage remains to the air, and part of the frictional work is recovered.

After many years of experience the system of hydraulic transmission has been carried to a high degree of perfection, and the conditions of success are well understood. To transmit power economically and efficiently by water a very high pressure must be adopted, and a moderate velocity in the mains. That moderate velocity in the mains is dictated not only by considerations of friction, but also more imperatively by the necessity of limiting the stresses due to the inertia of the incompressible mass of water in the mains when the velocity changes. The whole mass of water in the mains must change velocity simultaneously, and hence the shocks due to sudden changes of velocity are very serious. Now both the high pressure and the low velocity limit the size of mains which can be used, and therefore the amount of power which can be transmitted.

Systems for transmitting power by compressed air are not as yet so completely worked out, nor are the conditions of economy and efficiency so well understood. The unavoidable heating losses in compression limit the pressures which can be used in air transmission, and it is doubtful if in any case efficiencies quite so great as those attained with water can be realized with air. Nevertheless there are cases where the moderate pressures used in air transmission are far more convenient than the high pressures required for water transmission, and there appears to be no definite limit to the size of the main which can be used, or the amount of power which can be transmitted, if necessary, by air. For three reasons the velocity of flow in the mains may be very much greater with air than with water. The friction in the mains is less with air than with water in the ratio of their densities. The frictional work is less an evil with air than with water, because part of that frictional work is recoverable. Lastly, the elasticity and small density of the air makes the danger of shocks or inertia stresses to practically vanish. Water can only afford work less than the product of its pressure and volume, but air used expansively gives an amount of work greater than the product of its pressure and volume. Hence it turns out that with a given size of main a considerably greater amount of power can be transmitted with air of moderate pressure than with water of very great pressure.

As the air flows along the main the resistance of the surface of the main has to be overcome and the pressure falls. In

correspondence with this the volume of the air and its velocity increases, and it is necessary to know the law of expansion. The work expended in friction in the pipe generates heat, and if all this heat is retained in the air then the expansion would be exactly isothermal. Thus, in a perfectly non-conducting main the temperature must remain constant, however rough the main and however great the fall of pressure due to frictional resistance. Actual mains are not non-conducting, and, no doubt, if air entered the main at a higher temperature than the surrounding soil, some heat must be lost by conduction. If, however, as has been assumed, the air enters the main at 60°, which may be taken to be practically the temperature of the soil, no heat can be lost by conduction. The main is for air at that temperature incapable of conducting away heat, and the expansion in the main must be isothermal.

It follows from this that there is an essential difference between the transmission of power by water and the transmission by air. In the former case the frictional work in the main is wasted and lost. The heat produced in the water does in no way add to the effective work of the motor driven by the water. But with air the heat generated expands the air, and the air does more work in the motor in consequence of its expansion. However long or rough the main the energy of the air per pound remains constant. To the extent to which the pressure falls the air may be less serviceable in doing work in actual motors. But this does not destroy the advantage of air in transmission, though it may reduce it.

The project of a trip of the American engineering societies for a joint visit to Europe is beginning to take tangible form. E. N. Carbutt, president of the Institution of Mechanical Engineers, of London, has tendered an invitation to the American Society of Mechanical Engineers, and the latter have now issued a preliminary circular asking members of the three societies, the Civil, Mechanical and Mining Engineers, to inform the committee, W. R. Hutton and W. R. Wiley, whether they can attend.

The Chicago, Rock Island and Pacific Railway have issued a circular calling the attention of shippers to the completion into Colorado of the lines of their Western extension, the Chicago, Kansas and Nebraska Railway. A new route has been formed to Denver, Colorado Springs and Pueblo from Chicago, without transfer. A fast through freight service has already been inaugurated, while the passenger facilities provided over the new line are of the very best character. A New Joint Through Freight Tariff, comprising a pamphlet of 121 pages, which took effect on November 10, has just been issued. This tariff, besides showing through rates to the West from Chicago, presents a basis upon which through rates may be figured from points on the Atlantic seaboard and also from the manufacturing centers in Indiana, Michigan and Ohio, as well as other sections of the Middle and Western States. Freight from the East is delivered to the company at Chicago, outside the city limits, thus avoiding the delays and annoyances from the transfer of freight through the crowded Chicago yards.

In a recent article entitled "Dynamical Terminology," commenting on the rapid multiplication of new dynamical units, such as the "kine," the "bole," and the "barad," the *London Engineer* very appropriately says: "The world has for some time been acquainted with the erg, the velo, the cello, and other words of cognate

import. We may say, for the benefit of our younger readers, that engineers never use these words; but it does not follow, therefore, that they are useless or inappropriate. In the first place, certain minds find an innocent pleasure in inventing such terms, and it is so seldom that we find the physicist inventing anything that we should be slow to step in and try to put a check on his efforts. Indeed, we should not criticise boles, barads, and ergs, in any way, were it not that time may unfortunately be spent to little purpose by engineer students in learning how to use them, and the student has so much of importance and value to learn that every hour is an object."

The question whether the pressure of a saturated vapor is the same in a vacuum as in the presence of a gas is still a disputed one. Regnault attributed the differences observed by him to secondary causes, such as the deposition of condensed vapor on the walls of the containing vessel. Mr. F. Braun describes a series of careful experiments on sulphurous anhydride, from the results of which he arrives at the conclusion that the pressure of this vapor at the temperature of condensation is diminished by at least 3.9 mm. of mercury by the addition of an equal volume of carbonic anhydride at the same pressure and temperature, and by 1.3 mm. by the addition of an equal volume of nitrogen under similar circumstances. He infers in general that the pressure of a saturated vapor is not the same in the presence of a gas as in a vacuum, even when all disturbing causes are absent. The question is of importance in relation to the dissociation of gases, and up to the present it has not been found possible to decide it on theoretical grounds.

The December stock sheet of Joseph T. Ryerson & Son, of Chicago, contains some special features in connection with steel plates which are worthy of notice. Inasmuch as many boiler-makers use for flanging purposes any steel that they find capable of standing flanging tests, even though it was put on the market as tank steel, this firm have determined to make an effort to fix a standard of quality under which flanging steel may be sold with a full knowledge of its character. They have, therefore, had their Juniata flange steel made to conform to the United States Government requirements for marine boilers. Plates from the mill will be furnished when wanted, with coupons or test pieces attached for testing. This new departure will be appreciated by a large class of boiler-makers as well as boiler users. The stock sheet just issued contains a large addition of odd sizes not frequently carried in stock by plate merchants.

The Stonefield and Factory Iron Works, Bilston, Staffordshire, England, the property of the executors of the late Joseph Sankey, and for upward of a quarter of a century carried on by the Bilston Iron Company, have been leased to William Molineaux, who will carry them on in conjunction with Edward Jordan, and will trade under the old style of the Bilston Iron Company. The new firm have also purchased the good will and brand of the old firm, and will immediately put the works in operation, and continue to supply the White Swan brand of sheet iron. The works stand on about eight acres, and comprise five sheet mills, 17 puddling furnaces, and all the necessary plant for the manufacture of galvanizing, working up and other sheets. A steam hammer will at once be put in, and a railway siding is being arranged for. The negotiations have been conducted by Mr. John E. Perry, of Wolverhampton, England.

THE WEEK.

The new building for the Progress Club, to be erected on Fifth avenue and Sixty-third street will cost \$500,000. The architectural plans are those of Alfred Zucker & Co. The material used in the facade will be fawn-colored brick, terracotta and gray rock, with ornamental iron-work for balcony, railings and window guards.

A trades school for colored boys is about to be established in Philadelphia under the auspices of the Institute for Colored Youth, which has about 300 pupils. A large three-story brick building will be erected and fitted up with all necessary tools and appliances.

President Diaz, newly elected as chief executive of the Mexican Republic, has entered upon a new term of official existence, and important results from the standpoint of trade and industrial enterprise are predicted for his administration. He proposes to carry forward to a successful issue two great undertakings—one, the drainage of the valley of Mexico, and the other the building of a railway line to connect the national capital with the rich State of Oaxaca. Together, these projects are expected to absorb some \$40,000,000, and, as the President and General Pacheco, the Minister of Public Works, are both exceedingly friendly to citizens of the United States, contractors outside of the Mexican republic will watch developments with special interest.

By the decision of the Court of Appeals at Albany Cornell University is deprived of \$1,500,000 willed to it by Jennie McGraw-Fiske, wife of Professor Fiske and heiress of the McGraw estate. The decision is based on the fact that Cornell University was limited by its charter to property possessions not exceeding \$3,000,000, and that it had that amount before the bequest of Mrs. Fiske. The decision does not determine the future distribution of the money.

It is reported in Chicago that an agreement has been made by representatives of Western and Southwestern roads to form a railroad clearing house, which is another name for a "trust." It is believed, however, that the trust or clearing-house plan is in conflict with the Interstate law, as it is nothing more or less than a pooling of all the railroad interests in the West.

The Common Council of Reading, Pa., has passed an ordinance making it unlawful for any contractor on public works, such as sewers, reservoirs, public buildings and the like to employ any but citizens of the United States. It is said that the ordinance emanates from labor organizations in Reading, and that it is part of a concerted effort to be made in all the leading cities to put a stop to the importation of foreign contract labor.

The old material of the Great Eastern realized \$290,000, thus disproving the old maxim that a live jackass is worth more than a dead lion.

A powerful new labor organization, to deal with political questions, is said to be in course of formation in Pittsburgh, under the lead of John Jarrett, Charles Litchman and others who do not precisely agree with the methods of Mr. Powderly. Thomas Barry, ex-K. of L., has still another scheme in embryo.

The Emperor of Brazil is contemplating large railway projects and offers valuable concessions to any syndicate prepared to enter into engagements for construction.

The jute bagging trust is said to be falling to pieces, owing to the shrinkage in sales. There are, in all, 24 bagging factor-

ies in the United States, and of these 16 are shut down, having been leased by the "combine" and closed to lessen the production and to stiffen prices. The first day of January these leases expire, and the 16 factories are ready to start up again unless once more leased by the trust, for which thus far there has been no arrangement made.

The new court house at Evansville, Ind., just commenced, will be a thoroughly fire-proof structure, costing \$500,000.

Commercial travelers are endeavoring to have the Interstate Law amended so as to permit concessions by railroad companies in favor of recognized merchant drummers.

Pittsburgh glass manufacturers have received an order for 1000 boxes of lamp chimneys for China, equal to 6000 dozen.

Commodore Walker, Chief of the Bureau of Navigation, says: "It is a matter of national satisfaction that it has fallen to the United States to take the initial steps which it may be confidently hoped will lead to a codification of the rules of navigation, and thereby promote immeasurably the safety of ships at sea."

It is stated from Washington that there is a great deal of influence being exerted to bring about a special session of Congress to authorize the admission of the Territories as States, and to begin the work of tariff revision.

The street railway service in the city of Mexico is to be done by American locomotives similar to those on the New York elevated roads.

A Bradford, Pa., correspondent makes the statement that the great oil fields of that State are being rapidly and surely exhausted. Hundreds of wells are being drilled, with indifferent success. The writer says: "If none of the 500 wells now drilling find a rich spot, the Ohio fields must become the center of the great petroleum industry, and Ohio oil is pretty sure to take its place as an illuminant as well as the fuel of the future. The Ohio field exceeds in area any field yet found in the world, and its possible daily yield is placed by practical men as high as 100,000 barrels a day. The work of removing the monster iron tanks from the Pennsylvania fields into the Lima district still goes on. A dozen crews of men are at work every day cutting down the empty tankage in the Bradford district, all of it being intended for Ohio. The amount of oil now held in iron tanks in the Ohio field exceeds 9,000,000 barrels."

Russia for some months past has been attempting to effect a national loan in the European markets, without success, the object being ostensibly to prosecute railway enterprises and systems of internal improvement, but her ultimate purpose is believed to be to push her territorial claims in the direction of India. A prominent New York broker is reported as saying that the Rothschilds had first been offered the loan or any part of it, but the offer was promptly declined, and overtures to two well-known English houses resulted in like manner. "Something was then decided upon," the account runs, "which was decidedly out of the usual run of financial operations. The New York banker received a letter from his correspondent in Berlin, telling him of the difficulties experienced by the Russians in the European money markets, and asking him if he thought he could do anything with the bonds in this country. He at once returned word that there was no hope of such a thing. Then he explained why there was not. He said it was true that money was very low in this country, and that there was plenty of it, but that the peculiarity of the American investor was

that he wanted to see something tangible in which he was to invest. There were plenty of chances in the American markets for investments—chances, too, where the element of risk was reduced to the minimum, and it was in such, and such alone, that American money would find its natural outlet. Unless the rate of interest on the Russian bonds was equivalent to 7 per cent., and based upon some surer foundation than other loans to that Government had been, there was no chance of raising \$1,000,000 in the United States. A reply to this letter was that the highest proposed rate of interest was 5 per cent. Thereupon negotiations were declared closed." The prediction is made in Wall street that within three months Russian bonds bearing interest of 7 and 8 per cent. will be offered in the money markets of the world, with no takers, and that the country will find itself in a very perplexing situation.

The fact that the leaves of pine trees can be manufactured into bagging, and compete successfully with jute for baling cotton, is information of inestimable value to all who are engaged in cotton growing in the South. There are other uses also for which pine leaves may be used, such as the manufacture of paper pulp, pine wool for stuffing mattresses and pillows, quilts, upholstering furniture and a hundred other things unthought of at present.

A number of the Southside glass manufacturers in Pittsburgh are in revolt against the alleged extortionate prices of natural gas, and are combining to establish an independent gas company to make their own fuel. Manufacturers who paid \$700 a month last year now have to pay \$900, \$1000 or even more than that per month in some cases.

The Commissioner of Internal Revenue has made an elaborate report, showing that the total receipts for the fiscal year were \$124,326,475, an increase of \$5,489,174 over the receipts of any year since 1883, when the receipts aggregated \$144,553,345. The receipts for the year were also \$4,326,475 more than the estimate. The estimated receipts for the current fiscal year are \$125,000,000, provided no changes are made in the existing rates of taxation. The cost of collection of internal taxes for the year was \$3,978,383, being less than 3.2 per cent. of the amount collected.

The scourge was driven out of Jacksonville by Jack Frost, after 408 persons died. There were 4677 cases of fever.

Among new industrial enterprises in the South reported last week is a \$5,000,000 company composed of New England capitalists, organized at Fort Payne, Ala., to develop mineral land, build furnaces, a rolling mill, &c.

The Gansevoort Market Building, in this city, which cost \$477,000, will be formally opened 17th inst. It is pronounced the finest structure of its kind in the United States. The location is on West street and Thirteenth avenue. A portion of the west-side wholesale trade is expected to follow the market building.

The season of navigation on the Erie Canal has proved well-nigh disastrous, chiefly on account of railroad competition, for notwithstanding about 40,000,000 bushels of grain were transported by the water route, surpassing the total of 1886, the average freights have been so low that few boatmen have realized any profit. "Even when we were taking oats at 14 cents to New York," said a leading boat owner, "the roads cut under that ruinous rate and took the grain away from us. They must have carried oats for about 1 cent a bushel, and that, too, when no one was in a hurry to get grain to the seaboard. I have never seen the roads fight us the

season through as they have done this year. Here is a point that the friends of the canal should ponder well. Do they suppose that the roads were willing to run a car through to New York for less than \$10 from a spirit of mere day-by-day competition? Was it not rather a part of a deep-seated policy, never quite lost sight of, to beat out and ruin the canal interest in the end? It was stated within a week from the time the canal shipping season closed that the roads were already getting 11 and 13 cents a bushel on corn and wheat respectively from Buffalo to New York. "If the roads keep on fighting us like this," said the boatman quoted above, "it is only a question of time when our property will be rendered worthless and our business gone."

The line of American steamships plying between New York and ports in Venezuela has had uninterrupted prosperity, and now comprises a fleet of the first class. The owners, Boulton, Bliss & Dallett, coffee importers, have just placed another contract for a steamer of about 3000 tons with the Crumps, of Philadelphia, making the third contract of this character within the last six months, together representing an additional investment of nearly \$1,000,000.

About 3000 men are at work completing the Poughkeepsie bridge and its connections.

It is proposed to remove the New York Mercantile Library from Clinton Hall, Astor Place, where it has been located for 30 years, to a site at Broadway and Thirty-seventh street.

The Mexican Southern Railway, to extend from Puebla to the State of Oaxaca, will open a tropical region of great fertility, and, aside from local advantages, will shorten by five or six days the time from New York to Lima, Valparaiso and other points on the West Coast of South America.

The extent to which the foreign trade of New York is being monopolized by British vessels appears from the fact that of a total of 322 arrivals at this port during November 167 were British. In all classes of vessels, excepting steamships, there is a falling off.

The most important points in the reports from the several Territorial Governors, as bearing on their prospective admission as States, relate to population, which is estimated as follows: Alaska, 49,850; Arizona, 83,000; Dakota, 600,000; Idaho, 100,000; Montana, 140,000; New Mexico, 175,000; Utah, 210,000; Washington, 167,982, and Wyoming, 85,000.

The gross damages to be paid by the elevated railway companies on account of injury to property on the line of their roads in this city is estimated at \$12,000,000, in case the recent awards by Commissioners appointed to adjust claims of owners serve as a precedent for future decisions.

The second step in the commercial conquest of Zanzibar is a joint blockade of the coast by the English and German fleets.

An experimental paper stock mill at St. Louis has demonstrated that the waste or refuse lint of mills that make cotton-seed oil is almost as valuable as the oil itself, this substance being convertible into paper. The receipts of the cotton-seed oil mills, it is said, will be almost doubled from that source, while expenses will not be greatly increased.

The latest scheme for the extension of the foreign commerce of the Dominion is to establish a line of steamers between Montreal and New York and Para, in conjunction with a steamboat and railway

system extending to the headwaters of the Amazon. Brazil is prepared to make valuable concessions. Thus far the various proposals for lines of steamships to France, the West Indies, &c., emanating from Canadian sources have come to naught.

The Director of the Mint, in his annual report just submitted, estimates the amount of the precious metals in the United States on July 1, 1888, either coined or awaiting coinage, at \$1,100,000,000 in round numbers. Of this \$700,000,000 is in gold and the remainder in silver, as follows:

Com:	
Gold.....	\$595,349,637
Silver dollars.....	299,708,790
Subsidiary coin.....	76,406,376
Bulion:	
Gold.....	110,469,016
Silver.....	3,950,388
Trade dollars.....	6,545,554
Total.....	\$1,092,429,761

The Florida orange crop this year is equal to 3,000,000 boxes, or at least double the yield of any previous year. This aggregate would load 14,000 cars, for which the railroads will get 60 cents a box, over \$1,800,000.

The New Orleans *Times-Democrat* has interviewed the leading Spanish and Cuban merchants in that city in regard to the question of Cuban annexation to the United States. While nearly all agree that annexation might prove highly advantageous to both, Spain would never acquiesce in such a proposition, on any terms possible.

The future of the United States was pictured in rosyate hues by Mr. Gladstone in a recent interview with Minister Phelps. He said: "America has a magnificent future if the American people are only true to their possibilities. Before the close of the Twentieth Century the vast continent embraced within the limits of the United States, stretching from the Atlantic to the Pacific and from the Gulf of Mexico to the great lakes of the North, will be the home of 300,000,000 of free-men, representing every nation upon earth; vaster in extent and population than the Roman Empire in its palmiest days, but free from the danger that attended the extension of that empire among barbarous peoples, which was the primary and potent cause of the decline and fall of the greatness of Rome. Every true Englishman should be proud of the progress of the United States, for the Americans are our kith and kin, and having the same literature, the same language and the same sturdy love of political independence. The wresting of Magna Charta from King John prepared the way for the battle of Bunker Hill and the Declaration of Independence." Nothing would give him more pleasure than to visit the United States, he added, but he had never been able to find the time.

Car Demurrage.—Considerable annoyance is being experienced at Chicago by a new rule governing demurrage on cars which has been adopted by the railroads centering at that point. A charge of \$2 per car is now made for each 24 hours after the first 48 hours expiring upon its arrival at Chicago. This new rule has been rendered necessary by the scarcity of cars and the consequent imperative need of having them unloaded as promptly as possible. The inconvenience of such a regulation is felt principally by those who receive coal and coke, but it also extends to consignees of iron and steel. A considerable quantity of pig iron is handled by some dealers on consignment, and the quick sales thus occasioned will prevent them from getting as good prices as would otherwise be the case.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 4, 1888.

Senator Allison called up the Senate Tariff bill to-day and will press its consideration until the opposition have developed their position. His purpose, if possible, is to get a vote before the holidays. The bill will require considerable amendment to adapt it to the wishes of certain interests which were assured, before the adjournment, of recognition. This relates notably to the tin-plate duty and to the correction of the coal slack or culm error on the free list. The Senator will make an effort to close general debate without delay and begin the consideration of the bill for amendment.

The Senate Committee on Finance at their meeting to-day decided to grant certain hearings which were omitted or crowded out before the adjournment. Yesterday the Forehand Arms Company, of Worcester, and Colt's Arms Company, of Hartford, were heard. A hearing has been assigned for the razor interests, represented by Mr. Torrey, of Worcester, which may be had after the adjournment of the Senate to-day.

The President's message has materially stiffened the friends of the administration in their determination to adhere to the policy advocated in the message of last year. There is now no doubt that the tariff reformers of the House will renew their fight as soon as the Senate bill reaches their body, which may be regarded as a conclusive indication that there will be no concurrent legislation on the tariff at this session of Congress.

The prospects of a deadlock in the House on the Direct Tax bill makes it more than probable that no business, except the passage of the appropriation bills, will be accomplished at this session, and it may even be doubtful whether they will get through if much time is consumed in parliamentary skirmishing over the direct tax question. If no tariff legislation be reached an extra session may be regarded as a certainty. That question and the admission of the four new States are matters which the Republicans are determined to settle without delay.

Philadelphia advices deplore the gradual disappearance of the grain trade from that port, until at the present time the total shipments are insignificant. The *Record* says: "During the five years between 1883 and 1887, inclusive, Philadelphia held about equal sway with Boston, while during the present year it will fall far below Boston, and both the receipts and exports will be but a tithe of those of New York and Baltimore. The big grain elevators at Girard Point and at Richmond, and elsewhere, are put to but little use, while hundreds of vessels that might otherwise load with grain at Philadelphia are forced to go away with empty holds, or loaded with ballast, to other Atlantic ports."

The Lehigh Coal and Iron Company have erected a plant of 50 beehive coke ovens at West Superior, Wis., in which they are using the screenings of their Connelville coal. A number of the ovens are now in operation producing a very good quality of coke. The managers of the company contemplate introducing the process of the National Coke and Fuel Company to utilize the waste gases and other by-products thrown off by the coal in being coked. The experiments of the company are being watched with much interest by the manufacturers of Duluth and its vicinity, as they will go far toward establishing the advantages to be realized from hauling coal to Duluth and coking it at the point of consumption.

MANUFACTURING.

Iron and Steel.

Announcement is made that the National Tube Works Company, of McKeesport, Pa., has purchased the plant of the Cartwright Iron and Steel Company, at Ali-kanna, near Steubenville, Ohio. The purchasers will begin at once to renovate the plant for the purpose of manufacturing muck iron. They will put in a mill and six double puddling furnaces in addition to the 11 singles and scrap furnace now there, making their capacity 60 tons per day. The works will give employment to upward of 200 men, including 45 puddlers. The muck iron made will be principally 8-inch, and will be used at the tube works.

The new lap-weld furnace now in course of erection in the pipe mill of the Riverside Iron Works, at Wheeling, W. Va., is almost completed and will be fired up in a few days. This additional furnace will give the pipe department facilities to meet the steadily increasing demand for this product.

Wm. Swindell & Bros., engineers and builders of regenerative gas furnaces, Pittsburgh, are engaged in the erection of a large Siemens gas furnace for the Moorhead-McCleane Company, proprietors of the Soho Iron and Steel Works, in that city.

The Valley Iron Works, at Coatesville, Pa., formerly operated by C. E. Pennock & Co., but recently purchased by W. W. Kurtz & Sons, are being repaired and will probably be started up about the 1st of January next, operating one set of rolls, and a full complement of hands will be employed as soon as trade will warrant.

The Pittsburgh Tuyere Works, Limited, formerly the Pittsburgh Smelting Company, Limited, manufacturers of wrought copper and bronze tuyeres, coolers and bosh plates, brass and bronze castings, have removed their office and works to Nos. 83 to 95 Main street, Allegheny.

The 24-inch mill department of the National Tube Works Company, at McKeesport, Pa., has closed down for the winter, and 150 men employed there will find work in other departments of the plant. The demand for 24-inch pipe is over for the present, which accounts for the closing of that department.

On Saturday, the 22d inst., Jones & Laughlins, Limited, of Pittsburgh, will apply for a charter under the name of the Jefferson Gas Company, with a capital of \$100,000. The firm has secured a quantity of natural gas territory in Jefferson township, Washington County, and will drill wells there and pipe the fuel a distance of over 15 miles to Pittsburgh to supply the American Iron Works and Eliza furnaces. A member of the firm states that they will probably not have any gas in Pittsburgh before next summer, but that they eventually are insured against the frequent shortages which have proved so expensive in the past.

We are informed that the report that the Kittanning Iron Company, Limited, of Kittanning, Pa., have been compelled to close down their rolling mill and blast furnace for an indefinite period on account of a shortage in natural gas is without foundation. The firm manufacture only pig and muck iron, and the output of the latter product of October was 1782 gross tons, and for November was 1550 gross tons. The plant was closed down for three days in November on account of the election and Thanksgiving.

For the first time in some years the Glendon Iron Company, of Easton, Pa., have their space nearly a mile long, free of stacks of pig iron. Six months ago the

company had this space occupied by between 20,000 and 40,000 tons of iron, all of which has since been shipped. The amount of iron on their wharf along the railroad has also been reduced, and the supply on hand is now believed to be less than 500 tons. Some of the iron on the mile space was made when the price of rails was \$40 per ton and a large share of it when between \$25 and \$35. Two months ago the company started to prepare three of their furnaces for blast, but it is doubtful if any of them will be in service before spring.

The Andrews Brothers Company, of Youngstown, Ohio, under date of the 27th ult., write us as follows: "We are building four new double-puddling furnaces. These we require to supply our increased finishing capacity."

Some days ago the rim at the top of the Hinrod Furnace, which is operated under lease by the Mahoning Valley Iron Company, of Youngstown, Ohio, broke, and allowed the bell to fall. The furnace as a consequence has chilled above the tuyeres.

James P. Witherow, of Pittsburgh, has received a contract for the erection of a blast furnace for the Jefferson Iron Works, of Steubenville, Ohio. The furnace will be 18 x 80 feet and will have a capacity of about 200 tons per day. Work on the foundations has already been commenced.

It is ascertained on good authority that the new rail mill of the Allegheny Bessemer Steel Company, now in course of erection at Duquesne, Pa., may not be put in operation before March 1, 1889. Nearly all the machinery has arrived and is being put into position, but there is a vast amount of work yet to be done, so much so that it is evident that the works will not get started before the time stated above.

The Swindell Construction Company, of Pittsburgh, have about completed a contract for the Riverside Iron Works, of Wheeling, W. Va., which included the erection of one four-hopper gas-producer, each hopper with a grate surface of 24 square feet, one binding furnace, hearth 6 x 24 feet, and a welding furnace with a hearth 7 x 24 feet. Nearly 300,000 fire-brick were used in the construction of these furnaces.

The blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, has been in continuous blast for 26 months, and in that time has produced over 100,000 tons of Bessemer pig iron, and is apparently good for six months longer. The steel plant of this firm is also in continuous operation and is producing an average amount of slabs and billets per day, the larger portion of the output being made in the form of billets for wire rods, sheets, &c. The nail factory department has been idle for some months and will not resume operations until there is a decided improvement in the nail market.

The new furnace of the Cameron Coal and Iron Company, at Emporium, Pa., Joseph Hunt, general manager, was blown in on Tuesday, the 27th ult.

An Associated Press telegram from Joliet, Ill., states that ground was broken there on the 26th ult. for a large steel plate mill, which will employ 1000 men when completed. We are advised by those in a position to know the facts that this statement is premature, and the intention of the projectors is exaggerated. A steel plate mill is contemplated, and perhaps other departments may be added to the works for the manufacture of specialties, but thus far nothing has been settled with sufficient definiteness to warrant the publication of the plans of the projectors. The works will be located near the plant of the Joliet Steel Company, who will ex-

pect to furnish the steel to be manipulated. But a separate company will be organized, the name of which has not yet been announced.

A press dispatch from Springfield, Ohio, under date of the 2d inst. says: "Hon. John Bookwalter, of this city, has been engaged in perfecting and introducing a new process for the manufacture of steel. Steel of all grades and even wrought iron of the highest purity and quality can be produced from the pig iron in eight and one-half minutes and at a cost even less than by any process hitherto known. One great feature of the process is that it can be run with certainty into castings of all forms and sizes, producing castings true to the pattern, remarkably sound and free from pores and bubbles and possessed of extremely high tensile strength and ductility. The Bookwalter plant here is capable of turning out 100 tons per day."

Mr. I. Droege, Sr., has resigned the position as general manager of the Maumee Rolling Mill Company, at Toledo, Ohio, on account of poor health, and has returned to Cincinnati. The board of directors have elected as his successor George F. Russell, of Zanesville, Ohio, who was connected with the old and successful mill of the Ohio Iron Company at that point for a number of years. They have also chosen Mr. Chas. A. Borts, recently superintendent of the Youngstown Rolling Mill, as mill manager. The capacity of the Maumee mill is about 125 tons of finished product per day, consisting of bar, band, angle and shafting iron, flange, boiler, tank and sheet iron and steel. This company will also make a specialty of agricultural iron. The fuel used is natural gas. A blast furnace will be erected at Toledo the coming year, which will be a great advantage to consumers of foundry iron in that locality.

E. S. Cook, manager of the Warwick Furnace, Pottstown, Pa., writes to us that that famous record-breaker has outdone its own past achievement. For the week ending November 24 the furnace made 702 tons of iron, 250 tons being No. 2 foundry and 452 tons open gray forge, using three-quarters anthracite coal and one-quarter coke. So far as we are informed, this exceeds any product yet obtained, with anthracite coal as the principal fuel, from stacks of moderate size. Warwick furnace is only 55 feet high, and has a 15½-foot bosh.

Machinery.

The Marion Steam Shovel Company, of Marion, Ohio, under date of the 26th inst., write us as follows: "We are now running on full capacity and have placed our order for quite an additional line of machinery to be placed in our shops, so as to be able to double our present capacity, which is necessary to fill our immediate demands."

Morse, Williams & Co., manufacturers of elevators at Philadelphia, in addition to their office at 108 Liberty street, New York, have recently established a branch office at 14 High street, Boston.

The Freeport Machine Company, of Freeport, Ill., made an assignment on the 27th ult. The assets are roughly estimated at \$40,000, of which \$24,000 is in notes and bills receivable, while the liabilities are put at \$27,000. The failure was precipitated by dissensions among the stockholders. The company have been in existence about seven years, had a capital of \$50,000, and were engaged in the manufacture of windmills, feed mills, cultivators and other agricultural implements.

The Gordon & Maxwell Pump Company, of Hamilton, Ohio, are at present working on a contract for three sewage pumps for Hyde Park, Ill., with aggregate

capacity of 9,000,000 gallons, two water works pumps for Troy, Ala., with capacity of 2,000,000 gallons, and two for Gladwin (Mich.) Water Works, with a capacity of 1,000,000 gallons. The company have thus far this year sent out over 40 pumps for water works in various parts of the United States.

The Heine Safety Boiler Company, of St. Louis, have been asked to bid on boilers, heaters, pumps and piping for 1000 horse-power steam plant for London, England.

The Crescent Foundry Company, of Allegheny City, Pa., who started a foundry in Brady's Bend, Pa., some months ago, have been compelled to shut down permanently on account of scarcity of natural gas and raw material which is used in making castings. The company occupy a section of the old Brady's Bend Iron Company's property, and had extensive buildings erected. Forty men were employed. The works will soon be removed to Allegheny.

Mr. J. W. Angell has been appointed to represent Russell & Co., of Massillon, Ohio, agricultural machinery manufacturers, in St. Louis, and will have his headquarters at No. 609 Pine street, in that city.

The Miller Chemical Engine Company have been incorporated at Chicago, with capital of \$300,000, for the manufacture of fire engines. The incorporators are A. Montgomery Ward, G. R. Thorne and J. W. Miller.

Miscellaneous.

Among recently authorized corporations in Illinois are the following: Lion Mfg. Company, East St. Louis; capital, \$75,000; incorporators, H. F. Fellows, George A. Bannantine and Charles K. Paddock. Colby Cook County Testing Machine Company, Chicago; capital, \$100,000; incorporators, George L. Hogg, Addison E. Shaffner and Everett W. Kibbe; to manufacture a weighing machine, lung tester, lifting machine and measuring machine for hight, all combined in one. International Construction Company, Chicago; capital, \$50,000; to build and equip railroads; incorporators, Lawrence C. Boyle, John R. James and John Ritchie. Rouse, Hazard & Co., Peoria; capital, \$30,000; to manufacture agricultural implements, carriages and type-writers; incorporators, Harry G. Rouse, Samuel B. Hazard and Sylvester Doubet. Certificate filed to increase the capital stock of the Machinists' Supply Company, Chicago, from \$25,000 to \$100,000; also, Illinois Malleable Iron Company, of Chicago, to \$50,000.

A company under the name of the American Catalogue Company has been formed at Minneapolis, Minn., for the purpose of arranging and binding under cover several catalogues of the same class. The object of this is to furnish the purchaser of machinery a complete and well arranged reference book of the class of machinery that he is likely to use. Another important object is to place the manufacturers' catalogue in the hands of those who will likely be his customers, and in such a way that when once placed it will be preserved from loss or damage. A few of the bound volumes of catalogues, we understand, have been in use for the past three years, and their usefulness and value have been such as to cause the formation of a company for the classification and binding of them for general use. The company are now collecting a large assortment of catalogues, so as to make the classification as complete as possible, and will probably send out the first volumes about the first of the year.

A company embracing a number of Chicago, Cleveland and other capitalists have been incorporated at Lima, Ohio, under the name Lima Lock Mfg. Company. The

capital is put at \$250,000, and the company will erect a factory, which it is stated will employ 500 hands.

Silver Coinage and Coin Certificates.

In his annual report Secretary Fairchild dwells as follows on the silver coinage and on the system of coin circulation by means of silver certificates:

The ownership of silver by the Government again was largely decreased, in spite of the increase of the total stock of silver dollars in the country, by the coinage of 16 months. During the past few years the decrease of circulation caused by the cancellation of national bank notes and by the deposit of money with the Treasurer by the banks to redeem their notes when presented for that purpose has been but little exceeded by the increased circulation of silver certificates and of standard silver dollars; thus silver seems to have filled the vacuum caused by the retirement of national bank circulation. The circulating medium in small denominations has been largely converted into silver certificates. And finally business has largely increased in the South and in portions of the country where there are few banking facilities. All of these causes have co-operated to postpone any evil effects which might arise from a continued and excessive coinage of the silver dollar; but the danger still exists and should be guarded against. This can be done by the adoption of the recommendation of my last report, viz., by fixing the maximum of silver which shall belong to the Government and by providing that when it was exceeded by \$5,000,000 the purchase of silver bullion should cease until the amount owned by the Government should be again reduced to such maximum, or by canceling United States notes to the amount of the excess over the maximum, provided the Government held the notes; if not, then by ceasing the purchase of bullion. Such plan, if adopted, would provide a safety valve which would be self-operative, and would assure the country against any possible danger from silver, for as soon as it exceeded the amount which could be absorbed in the business of the country it would begin to flow into the Treasury in payment of taxes and would be there held until business called for it, and when the Government's ownership fell below the maximum the purchase of the bullion would again begin.

Thus the country's business demand would regulate the country's silver circulation and there would be little danger of depreciation in the value of the silver dollar as compared with the gold dollar. I venture to predict that if some such safeguard is not adopted and if thereby the silver dollar is suffered at some time to lose a part of its purchasing power, that the people will demand the absolute stoppage of the silver bullion purchase, and, furthermore, the use by the Government of the whole or a portion of the silver coinage profits for the redemption of the silver dollars which are held by them. It is to be hoped that before such crisis is reached that the nations of the world will have agreed upon some standard of bimetalism which will forever maintain a fixed ratio between gold and silver, but in the meantime there is no occasion to burden ourselves with a stock of silver which may be troublesome.

The system of coin circulation by means of certificates has certain conveniences and advantages, but it is a costly form of money; last year the cost of the \$105,000,000 silver certificates issued was about \$421,000, and as more and more of these certificates are converted into smaller denominations this cost is likely to increase.

There are also certain dangers connected with it—for example, in time of war, the possession by the Government of such vast stores of the precious metals might prove embarrassing, and at a time when the Government was in financial need the temptation to spend the coin held against outstanding certificates might prove too strong. The loss by the abrasion of the coin, if it was in circulation, would not equal the cost of the certificates; on the whole, I think it may be said that the currency of the country would be more safe and more economical if the coin were in actual circulation instead of being held by the Government on pledge against outstanding certificates, as is now the case. But whatever may be thought about the wisdom of the certificate system there can be no doubt that with it the further coinage of gold and silver, except subsidiary coin, is not necessary or wise. Far more gold and silver coins are now in the possession of the Government than probably ever will be needed for the redemption of certificates. Future accumulation of the precious metals should be only in the form of bullion, which can be kept more safely and counted more easily than the coin. If this suggestion was adopted all but one of our mints might be closed, and large, useless expense be saved annually. I earnestly call the attention of the Congress to this subject.

Heating Buildings by Exhaust Steam.

At a recent meeting of the New England Railway Club, John A. Coleman said:

I have had a long experience in heating buildings by steam. When the matter of using exhaust steam was agitated, and most people were opposed to it, we took a number of mills, using then a 16-foot tubular boiler, and averaged a ton of coal a day. We heated the mill by using large pipes, having the circulation as straight as possible, open and free, with about 2 pounds back pressure on the engine, using no direct steam except in the morning in starting up and on Sundays. I had similar experience in heating the building of the Providence Tool Company during the war. The building was 70 feet wide by more than 200 feet long, the rooms with 15 foot studs, and large windows in an exposed situation, then heated by small pipes all around the walls, and using about a ton of coal a day for the boiler. In reconstructing we took out the small pipe, cut it up into coils, which we placed in the center of the building, using a 6-inch pipe as the main artery through the building, and a 2-inch socket-pipe for the condensed water, avoiding bends everywhere as much as possible. Result was that the building was overheated by using only exhaust steam, and about 2 pounds back pressure and no extra coal was used for the fires. My idea in heating is to use large pipes and carry a large body of steam to the point where you want to use it, and not strangle it on the way.

Morris J. Lippman, late of Graff, Bennett & Co., has been appointed agent for A. and P. Roberts & Co. Pencoyd Iron Works, Philadelphia, Pa., and has opened an office in the Commercial Building, southeast corner of Sixth and Olive streets, St. Louis, Mo.

The Metric Metal Company, of Beaver Falls, Pa., a recently chartered corporation, have leased a portion of the cutlery works at Beaver Falls, and machinery is now in place, and operations begun in the manufacture of natural gas meters and natural gas burning appliances. The company are largely interested in natural gas enterprises.

The Iron Age

New York, Thursday, December 6, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Crisis in the Steel Rail Trade.

A good many contradictory statements have been published in the newspapers during the past week about the steel-rail trade. To some extent they echoed some of the opinions expressed at the recent meeting of manufacturers in this city, pet plans being thus ventilated as though they had received general acceptance. During the meeting held a week since there was a general and a free interchange of opinion, but very little that was definite was agreed upon. It was proposed to so modify the association that minimum prices be agreed upon. That proposal met with an emphatic rejection by a number of the active manufacturers. The plan of establishing a common sales bureau, through which the orders would be distributed, met with a similar fate, so far as all the mills outside of the Chicago district are concerned. The only action finally taken was to allow of the sale of tonnage allotment by one mill to another.

The condition of the steel-rail trade is a sad commentary on the inadequacy of trusts and combinations. The rail manufacturers have been violently assailed during the past year as members of an iniquitous ring, and yet they have not even had the consolation of reaping the pecuniary rewards which trusts are supposed to confer upon their unscrupulous members. The fact is that the ties binding the members of the steel-rail association have had the strength only of the traditional rope of sand. So long as there was work enough for all at good prices, allotments were sacred. When business fell off the fact that the quantity allotted it was sold did not always deter a mill from securing a desirable order. The contest grew fiercer and fiercer until finally steel rails sold in the West at \$25 a mill. This has been done in more than one instance in the past two weeks, and while there is no direct proof that it has been done since the New York meeting, there is evidence that low prices are still being made.

There are those among the steel-rail manufacturers who believe that some plan can be devised by which the ruinous competition now going on can be ended. They are urging further conferences, which probably will be held. But others frankly acknowledge that natural causes alone can bring improvement. Railway managers acknowledge that rails are too cheap. They admit that the cost of renewal of track is ridiculously low, but many of them must confess that they have not got the money to take advantage of the opportunity offered. If the interests of the carriers of the country were not so thoroughly disturbed as they are the demand for rails would quicken most rapidly. There are many who insist that the railroad companies, for purposes of their own, are not adverse to having their

sufferings pictured in dark hues. But while these somber tints prevail it is difficult, if not impossible, for railroad managers to negotiate paper or for those who are building new roads to place bonds. The situation to some extent, therefore, appears worse than it really is. It may improve very rapidly so far as the Western mills are concerned. A few large orders may cause a recovery of a few dollars a ton, but, until that has occurred, the Eastern mills cannot hope to take any business. They are cut out of the whole West, and for the time being are driven out of the Southern market by Pittsburgh mills. They do not expect any new business in their own territory, east of the Allegheny Mountains and north of the Potomac River, simply because nearly all of it has been placed in the past two months. So far as the possibility of securing new orders are concerned, the Eastern mills have a barren future before them. Whether it is a matter much to be deplored by them may be questioned, since every sale of rails at competitive prices to-day involves a loss of a round sum to even the best-equipped and best-located mills in the country. We have heard of managers of some mills claiming to be able to produce rails at very low figures, but usually they themselves have acknowledged the inaccuracy of their statements, when the occasion which gave rise to them passed. While the crisis in the rail trade is not yet over, there are some indications which point to the return of more reasonable prices.

Progress in the Navy.

Secretary Whitney's annual report, which was issued last week, is in many respects an interesting document, and affords, undoubtedly, the most complete and trustworthy measure yet given of what has been accomplished in the Navy Department during the present administration. The accounts published from time to time during the past few years, reviewing the work done, have necessarily been of a fragmentary character, and information on the exact state of the navy has been more or less uncertain. The facts and figures now given, however, are entirely comprehensive and cover not only the results more recently attained in the United States, but refer also to what has been done in some lines by some of the foreign powers.

Briefly stated, the efforts of the Navy Department in ship construction have, since March, 1885, been devoted to unarmored vessels, the importance of this branch of naval armament having been very widely appreciated. As a result we have now the cruisers Boston and Atlanta and the dispatch boat Dolphin in shape for service, while the Chicago is practically completed, and several other vessels, like the Baltimore, Charleston, Yorktown and the dynamite cruiser Vesuvius, have been launched, and are being rapidly fitted out. In the line of torpedo boats also a good beginning has been made. With armored ships, on the other hand, but little has been done, the armored cruiser Maine having just been commenced at Brooklyn, and work on a few of the monitors having been carried on only in a desultory manner for several years. In the design of the battleship Texas some

changes, we understand, are yet to be made. With reference to the criticisms which have been liberally bestowed upon Secretary Whitney because of disappointing performances of some of the vessels already completed, and defective material and injudicious design in some of the others, it must be admitted after all that the work done is, in the main, satisfactory, and reflects credit upon the department. The severe attacks which have been made upon the alleged policy of the Department of building an English-American navy have but a slim basis and are scarcely worthy of consideration. For years the ships of the British navy had been held up as standards of excellence, and the question why their designs could not be profitably followed or adopted in modified forms in this country had been brought prominently forward on more than one occasion. The question has been practically answered by carrying out several such designs, which, moreover, appeared to be of special merit, and if the results have not been particularly flattering, they have at least taught a lesson worth knowing, and perhaps have effectually put a stop to the floods of non-professional advice which, only a short time ago, poured in upon the Navy Department. The last year alone has brought many surprises to naval authorities and to the public at large, and some of the features which in the near past were regarded as eminently desirable in the construction and outfit of a warship have since been condemned by practical test. It is impossible that, under such circumstances, ships and machinery can be constantly kept up to the requirements of the present.

The question of speed of warships, and particularly of cruisers, is an important one, and has deservedly been given much attention. The rate of speed has gradually been raised from 12 and 13 knots to from 14 to 22 knots per hour, and to secure these higher figures reduction of weight of machinery has been carried out almost wholly regardless of the results consequent upon reduced strength and rigidity, and of ultimate serviceableness. This applies not only to English ships, which have of late been more specially noteworthy for breakdowns, but with equal propriety to all of modern design—a fact borne out by the narrow time limits which it has been found necessary to adopt for trial trips. As at present constructed a vessel, with the best possible management in the engine-room, is barely enabled to go through a six-hours' trial satisfactorily, and, as has frequently been pointed out, will probably never again, under ordinary circumstances, be called upon to go through a similar performance. Should such a requirement present itself, even though the time of running at full speed be not more than two or three hours, a breakdown, as experience has shown, will be the inevitable result. Yet the vessels are rated according to their trial-trip speeds. What dependence, therefore, can be placed upon ships, classified under the present system as capable of developing, say, 18 or 19 knots, can be readily imagined.

The position has been repeatedly taken, and with good reason, that it were better the vessels were rated lower, in accordance with their actual capabilities, so that there would be the assurance at all times that the speeds counted upon could be attained

without difficulty. It is a dangerous folly to deceive one's self with the belief in a reserve of power which in point of fact is only imaginary. It is not reassuring, therefore, to find in Secretary Whitney's report the conclusion that "the machinery of naval vessels ought to be so designed as to produce 10 horse-power for each ton of machinery; and it was determined to make that the standard, and to enter into no contracts that were not based substantially thereon." This would correspond, at the outside, to a weight of only 224 pounds per horse-power. Whether or no this includes the boilers is not quite clear, but we presume it does not. If it does, the figure is ridiculously low, much lower than the weight ruling in the British navy—360 pounds per horse-power—and which itself has been found entirely insufficient to secure the strength necessary for the work required of the machinery. Assuming the 224 pounds to represent engines alone, and adding, say, 196 pounds per horse-power for boiler capacity, we would get 420 pounds per horse-power. This represents an increase over the British weight perhaps just sufficient to make all the difference between success and failure. Still it falls considerably short of the weight per horse-power ruling in high-class merchant steamers, which, as is well known, head the record of good performances, considered from whatever standpoint—speed, durability and economy. There is not now, so far as we know, a warship afloat which has been known to steam, or which could, in case of necessity, steam at full power for several days consecutively, nor even for a few hours, while in commission. In this respect they all fall entirely below comparison with what is being accomplished day after day, without intermission, by any one of a number of Atlantic steamers, and in these, it may be safely assumed, the weight of machinery has been kept down to a minimum consistent with safe working. There is only the one previously mentioned conclusion to be drawn from all this, that marine engines in the several navies are much too light for the power which they are supposed to be able to develop. It is only fair to admit here that the design of the machinery for a merchant steamer and that of the machinery for a man-of-war do not present parallel cases. In one instance, ample head room is available, while in the other, compactness is of the first importance, and the whole machinery, or as much of it as is at all possible, must be placed below the water-line. This condition alone often entails the necessity of having smaller and lighter parts in the design than would otherwise be desirable. Still, an effort should be made to adhere as closely as the circumstances will permit to examples of established success.

Secretary Whitney has evidently not lost sight entirely of the shortcomings of the engines designed for naval purposes, for to a table which he has compiled of foreign high-speed cruisers he appends a note to the effect that the speeds given are trial speeds and that a reduction of from 10 to 12 per cent. should be made to get corresponding maximum sea speeds. It would have been more correct to say simply that on regular cruises the engines could not be worked up to their full power or anything approaching it; but even as it is

the qualification is suggestive. The point cannot be made too prominent that a 19-knot cruiser on paper is not a 19-knot cruiser in practice, and that what up to the present time has been gained in speed on the trials by reducing the weight of machinery has been a gain so-called which can never be realized in actual service, and which even if attainable would have been secured at the expense of reliability and general efficiency. The conditions laid down for the designer of the naval marine engine of the present day in most of the cases directly invite disaster, though they might, we think, be easily modified so as to effect general improvement. Secretary Whitney seems to fully realize this when he says that "too much has heretofore been sacrificed to reducing weights of machinery beyond the limit necessary to secure desirable results. An increase of weight and machinery found necessary properly to maintain the desired speed entails either a reduction of ordnance, coal and other weights or an increase of displacement in each type; and this latter is the direction in which designs of cruisers (not especially built for police duties in time of peace) are now advancing." This would seem to show that Secretary Whitney, at least, is in favor of a very desirable departure from the policy now followed, though the developments will depend largely upon his successor. Taken altogether, what has been done thus far in adding to the navy has, for obvious reasons, been somewhat in the nature of experiment, and the results have been all that could be reasonably expected. The work, we believe, has been conscientiously done and constitutes a good basis for further operations.

The Copper Situation.

The copper and brass manufacturers have again made their contracts for copper for delivery during the next three months, the quantity, it is said, being larger than was involved in any previous sale. Manufacturers evidently have been punished in the past by the syndicate for taking less than they needed. They have been forced to pay anywhere from one-eighth to quarter of a cent above the contract price for additional copper. Manufacturers have been taught that it is very difficult, if not practically impossible, to secure any metal equivalent to Lake from outside sources, and that there is no superabundance of other grades not controlled by the ring. So far as we can gauge the situation the brass and copper manufacturers have been whipped into line and have practically given up any opposition to the syndicate. In spite of the editorial broadsides fired at regular intervals at the latter, its position is securer to-day than it has been for a long time. Well-informed men in the copper trade estimate that the syndicate must be carrying a stock to-day of not less than 125,000 gross tons. The European statistics are not complete. It is known that they do not include copper in some private French warehouses. They do not count accumulations of precipitate at the Spanish mines. Then the syndicate was until lately piling up copper at a lively rate in this country. It is reported that the stock at tidewater includes 6000 gross tons of Lake copper, 2000 gross tons of Arizona and other in-

gots and bars, 5000 tons fine of Boston and Montana matte, and 2000 tons fine of Anaconda matte. Here we have 15,000 tons alone. It is evident, therefore, that even if the Calumet and Hecla fire did cut off the whole supply of that mine there would be no danger of scarcity, except that the supply of shapes—that is, wire bars and slabs, of which the great concern has almost a monopoly—would be temporarily light. But, as a matter of fact, the misfortune of the bonanza mine is of little interest to anybody but its stockholders. We are officially informed that the Black Hills ground is open, as before, and that this part of the property is capable of furnishing 4,000,000 of pounds monthly—that, in fact, the greater part of the product has come from that section, even during the past few months. The possible small restriction in the supply from that source may be considered insignificant.

But of late another matter has developed which opens up very serious possibilities to the manufacturers of this country. We have lately dwelt upon the embarrassments and perplexities of brass-makers who are paying tribute to the syndicate and to the mining companies. It appears that recently domestic brass manufacturers have found themselves undersold in this country by foreign makers. Partly manufactured brass has been imported. Now, the Société des Métaux is the largest brass and copper manufacturing concern in Europe, controlling the French trade and having branch works in other Continental countries. It is evident that the Société will do all in its power to keep its own mills going to full capacity, and that it has a great advantage in so doing in the cheap copper it has at command. While American brass and copper manufacturers are paying 16½ cents, the syndicate gets copper in Europe equivalent in quality at about 13 cents, and makes a profit of about 1 cent on every pound it sells to other manufacturers. In reality it can deliver its own copper to its own mills on the basis of, say, about 12 cents. The spelter used in the brass is cheaper; its labor is lower, so that it can easily sell in this or any other country, where it has no mills, at a lower price than the home manufacturers, in spite of a tariff.

We do not charge directly that the Société is the one which is doing the selling of manufactured brass in this country. Possibly it may be somebody else crowded out of his own market by it. But with a concern as large as the Société is as a manufacturer, the temptation is great to seize the trade of others when its own is affected adversely in volume by restricted consumption. This is one of the possibilities of serious injury which may be inflicted upon a great industry, sorely pressed now by being forced to pay tribute to a gigantic gamble. There is little sense in wasting time now over predictions of ultimate disaster to the gamblers themselves. Every one sincerely hopes that they may not be successful in slipping out of some side door finally. No one has any sympathy with the syndicate except those who are its beneficiaries now, and the majority of whom will probably be nimble enough to get out before the crash comes. But opposition to the syndicate should not blind us to a correct appreciation of its power. Its grip seems as firm now as it has ever been,

and, as we have indicated, it has opportunities for mischief in other directions which may lead to invoking legislative protection.

Basic Versus Acid Wire Rods.

Always excepting tin plate and spiegel-eisen, there has been no branch of the iron and steel trade in which foreign material has played so important a part as it has in wire rods. With the rapid growth in popular favor of the barb-wire fence, and latterly of wire nails, the demand for wire developed enormously. The importations of foreign wire rods assumed very great proportions. Unfortunately the import statistics did not specially enumerate this article until 1884. Since then the quantities brought in have been as follows:

Imports of Wire Rods.

Year.	Gross tons.
1884.....	129,933
1885.....	93,882
1886.....	136,965
1887.....	149,350
Nine months 1887.....	122,263
Nine months 1888.....	82,008

It will be observed that the imports during the first nine months of the current year indicate imports of about 100,000 gross tons, a falling off of about 50,000 tons. The statistics of the production of wire rods are not obtained by the American Iron and Steel Association, the only cue to the quantity made being furnished by the statement of G. T. Oliver, before the Senate Finance Committee, that in 1887 the output was 188,738 tons, the capacity of the American mills being placed then at 285,000 tons. Since that time it has expanded further, and more mills are building or contemplated, so that the claim has been seriously made that in 1889 the United States will come to the front with a product of 300,000 tons at least, and possibly 325,000 tons. Importers concede that they expect to do comparatively little business in foreign common rods in the future. They have been crowded out of the great Western markets, and have only a moderate trade to look for east of the Alleghenies, and at or near tidewater. The capture of so great a trade by American producers is naturally a source of much gratification.

There is one point in connection with the progress of American industry in this particular branch which we have believed it to be of interest to investigate. When the basic process rushed into prominence in Germany it was soon found that the product of the new process was particularly well adapted for wire purposes. Until lately no basic Bessemer or open-hearth steel was made in this country, and of what little is made none, so far as we know, is drawn into wire. Unless imported basic billets are used, the wire rods rolled in American mills are of acid-Bessemer stock. Now, importers have steadily claimed that the latter was not as suitable for wire purposes as the basic material. The latter they urge is so much softer that it can be drawn down further without annealing. Some have insisted that, therefore, basic rods are worth at least 50 cents more a ton, and possibly \$1 per ton.

We have made inquiries on the subject from manufacturers of barb wire, of wire nails and of market wire. Those among them who have no affiliations whatever

with steel works or American rod mills frankly state that they prefer the basic material, one of them putting it in the following words: "We find that the basic rod will draw down much easier and will not cold, harden like Bessemer. It is easier on the tools, and for uniformity is much more desirable than the acid rod." Another wire manufacturer expresses the opinion that since the basic rods have come into use there has been a decided improvement in the quality of acid rods, so that now the latter are used by the wire-makers in many grades of wire for which they were formerly not considered suitable. One wire drawer informs us that some of the domestic material he has received was poor in quality—that he would not have any of the same make at any price, while other American rods were equal to any of the imported stock. He reports that as long as imported No. 6 basic rods of uniformly good quality can be bought for the same money which No. 5 domestic rods bring he will continue to purchase the foreign.

The managers of a number of the leading rod mills, all of them manufacturing wire also, write in very much the same strain. The majority of them admit that the foreign basic rods are a little softer, and agree in recognizing that there is some advantage in its being smaller—that is, the foreign rods are No. 6, while the domestic rods are No. 5. One of them, however, states that in his experience the slight difference between the two is entirely overcome in drawing by the intelligent use of a proper coating. Others insist that the rustiness of foreign rods more than makes up the difference in cost gained by their being softer and smaller.

This point has been brought out very clearly in our correspondence, that wire manufacturers do not consider the differences in quality of foreign basic and domestic or good foreign acid rods important enough to warrant any material difference in the price. Fifty cents a ton, or a maximum of 75 cents is as much as the majority of them seem willing to pay. This result has a significance beyond the question immediately at issue. If ever the United States is to become a producer of basic steel on anything like a large scale, the first channel into which its product is likely to go is the wire trade.

Argentine Loans and the Gold Drain.

The gold drain, which for months past has been going on from Europe toward the Argentine Republic, being the proceeds of loans floated, has at length begun to cause considerable uneasiness among financial men, not only in Europe, but in New York. While Buenos Ayres has drained London and the Continental money centers New York has in its turn been drawn upon by these. Thus, during the week ended November 24, Wall street bankers shipped no less than \$4,142,000, gold, supposed to be bought, most of it by the Bank of England, which is fortifying itself in order not to be obliged to raise the discount still further. As Hamburg had bought German gold coin and bars in the Bank of England, and shipped \$2,000,000 thereof to Buenos Ayres on November 19 and 20 by two steamers, the bank raised the price of such coin to 76/8, and bars to 77/11. From January 1

to November 24 the gold shipments from the United States amounted to \$36,500,000, as compared with \$14,000,000 for the corresponding period of 1887, while the receipts have been but \$7,500,000, as against \$39,000,000 for the same period last year—in other words, we have shipped \$22,500,000 more, and received \$31,500,000 less than last year, in a little less than 11 months, a difference of \$54,000,000, gold. Last month an experiment was even made for European account, and \$500,000 gold were shipped from New York to Buenos Ayres per steamer direct, as it was thought this might prove a cheaper method. Should the drain on New York continue, it would unquestionable lead to a stringency in our money market, and something of an upheaval in Wall street.

Fortunately, the stock of gold in bank in Europe and America on November 1 was about \$100,000,000 larger than at the same date last year; the drain is, therefore, for the moment less felt than it otherwise would. Reduced to millions of francs, it was as follows, compared with the year before:

	Nov. 1, 1887.	Nov. 1, 1888.
Bank of England.....	502	514
Bank of France.....	1,146	1,022
German Federal Bank.....	475	732
German Banks of Issue.....	137	192
New York Banks.....	394	462
Bank of Holland.....	101	128
Austro-Hungarian Bank.....	169	199
Italian National Bank.....	178	205
Italian Banks of Issue.....	128	149
Belgian National Bank.....	93	86
Bank of Portugal.....	16	29
Russian State Bank.....	844	964
Totals.....	4,183	4,682
Increase.....	499	

As the Argentines have to pay interest in gold in Europe for the enormous amount of money they owe, something like \$50,000,000 gold will have to flow back to Europe during a twelvemonth on that account, but this counter-current is nourished from month to month, while the proceeds of loans are drawn for from Buenos Ayres on Europe in big lots. Between January 1 and November 15 of the current year no less than 28 Argentine loans were placed on the markets of Europe, aggregating £28,702,766, or \$143,500,000 American gold. For the latter half of 1888 \$40,000,000 gold were expected from Europe, the Bank of England alone having shipped during the first six months £3,500,000 to the Argentine Republic. Nobody denies that the Argentine Republic is flourishing now more than it ever did before, but the paper basis on which the finances rest at home and the extraordinary inflation of the value of real estate and wild speculation generally centering at Buenos Ayres, recommend caution. Thus one of the leading newspapers in the latter city expresses itself about the general condition of the country in the following manner, under date October 18 last: "The Argentine Republic grows, blossoms and thrives not only from a material point of view, but morally and intellectually. New schools are springing up in all directions, and the Argentines themselves are becoming more and more laborious; formerly they, most of them, used to despise work. New banks, manufacturing and colonizing enterprises are being founded almost daily. At the same time mechanics, many of whom for some time past Argentines, and shopkeepers begin gradually to form a more and more solid middle class. Trade and traffic are

getting livelier all along in consequence of the fine cereal crops we have and the remunerative prices our grain fetches in Europe. The only dark cloud in the horizon is the high gold premium, which does not decline in spite of the extraordinary amounts of gold we are receiving from Europe; the premium is indeed a constant source of uneasiness for us. Why the premium remains so high is to us an impenetrable mystery, which it would be difficult to explain."

With the experience we have had with an irredeemable paper money, and the gold premium in the United States during and after the war, the mystery alluded to does not seem to us so deep; it is in reality more confidence which brings down a gold premium than a stock of gold which does not circulate in the country, flooded as the Argentine Republic is with paper currency. The latter has now taken hold to such an extent among the people down there that a return to specie payment cannot now be thought of, because it would bring down the inflated values, city real estate included, with a rush, and precipitate a big financial and monetary crisis. Hence the premium on gold will only begin to decline if a resumption of specie payment can be prepared for gradually, and thereby confidence in the paper tokens of many forms which have been cropping up restored. With us it was confidence in the intrinsic value of greenbacks and national bank-notes that brought down the gold premium, because our Federal debt was rapidly being reduced instead of increasing all along, as has been the case in the Argentine Republic. With their great enterprise in all directions, and insatiable loan absorption, the Argentines have created a situation which is, and remains, dangerous, their great present prosperity and heavy immigration notwithstanding.

Pittsburgh Freights.—The following new reduced freight rates from Pittsburgh to St. Paul and Duluth, Minn., went into effect on Saturday, the 1st inst. The new rates are via the Duluth, South Shore and Atlantic Railway, and are as follows: First class, \$1; second, 90 cents; third, 70 cents; fourth, 45 cents; fifth, 35 cents; sixth class, 30 cents per 100 pounds. Iron will be 35 cents in less than carload lots and 30 cents in carloads.

George A. Schuler, a member of the well-known firm of McClure & Schuler, engineers and contractors, Pittsburgh, Pa., died at his residence in that city on Sunday, the 2d inst., in the 51st year of his age. Mr. Schuler was in his usual health until the Saturday evening preceding his death, when he was suddenly stricken with apoplexy while attending to business. He was taken home and died the next morning, as stated. Mr. Schuler had an extensive acquaintance among the iron and steel manufacturers of the country, and had an enviable reputation for honesty and integrity in all his dealings. His funeral took place on Tuesday, the 4th inst., from his residence in the above-named city.

Quite an unusual proceeding among railroad corporations is the action of the Atchison, Topeka and Santa Fé and the Chicago, Santa Fé and California railroad companies, in filing certificates at Springfield, Ill., on the 30th ult., decreasing their capital stock. The capital of the former was cut from \$10,000,000 to \$5,000,000, and that of the latter from

\$30,000,000 to \$15,000,000. A great many other companies would doubtless more nearly approximate the actual investments made by the original stockholders if they were to follow the example set by these two companies.

The Message and Accompanying Documents.

President Cleveland's message, to a very considerable extent, is an epitome of the reports from the several departments. Respecting foreign relations the President has the satisfaction of announcing that: "there is no existing subject of dispute between the United States and any foreign power that is not susceptible of satisfactory adjustment by frank diplomatic treatment." By the cessation of Chinese immigration it is hoped, in reference to our relations with China, that a cause of unkind feeling has been permanently removed. The recommendation as to a treaty of reciprocity with Mexico is renewed, and the reorganization of the consular service is referred to as a serious matter. Little favor is shown to the contemplated Congress of American States to be held in Washington next year, the President expressing the opinion that "commercial policies inducing freer mutual exchange of products can be most advantageously arranged by independent but co-operative legislation."

The total revenues of the Government for the fiscal year ended June 30, 1888, amounted to \$379,266,074.76, of which \$219,091,173.63 was received from customs duties and \$124,296,871.98 from internal revenue taxes. The total receipts from all sources exceeded those for the fiscal year ended June 30, 1887, by \$7,862,797.10. The ordinary expenditures of the Government for the fiscal year ended June 30, 1888, were \$259,653,958.67, leaving a surplus of \$119,612,116.09. The decrease in these expenditures as compared with the fiscal year ended June 30, 1887, was \$8,278,221.30, notwithstanding the payment of more than \$5,000,000 for pensions in excess of what was paid for that purpose in the latter mentioned year. The revenues of the government for the year ending June 30, 1889, ascertained from the quarter ended September 30, 1888, and estimated for the remainder of the time, amount to \$377,000,000; and the actual and estimated ordinary expenditures for the same year are \$273,000,000, leaving an estimated surplus of \$104,000,000, exclusive of the requirements of the Sinking Fund, amounting to \$47,000,000 annually. The estimates of the appropriations required for the Government service for the fiscal year which will end June 30, 1890, aggregate \$323,467,488, which is \$3,063,305 less than the estimates for 1889 and \$3,530,511 more than the appropriations for the current fiscal year. The cost of collecting the customs revenues for the last fiscal year was 2.44 per cent.; for the year 1885 it was 3.77 per cent. The excess of internal revenue taxes collected during the last fiscal year over those collected for the year ending June 30, 1887, was \$5,489,174.26, and the cost of collecting this revenue decreased from 3.4 per cent. in 1887 to less than 3.2 per cent. for the last year. The tax collected on oleomargarine was \$723,948.04 for the year ending June 30, 1887, and \$864,139.88 for the following year.

With regard to the surplus devoted to the purchase of bonds, the President remarks: "If this surplus, under the operation of just and equitable laws, had been left in the hands of the people it would have been worth in their business at least 6 per cent. per annum. Deducting from the amount of interest upon the principal and premium of these bonds for the time they had to run at the rate of 6 per cent.

the saving of 2 per cent. made for the people by the purchase of such bonds, the loss will appear to be \$55,760,000. This calculation would seem to demonstrate that if excessive and unnecessary taxation is continued and the Government is forced to pursue this policy of purchasing its own bonds at the premiums which it will be necessary to pay, the loss to the people will be hundreds of millions of dollars." The purchases of bonds have been (par value), up to November 30, \$94,700,400, and the premiums have amounted to \$17,508,613. Counting the money as worth in the hands of the taxpayers 6 per cent., there is on this transaction a net loss of \$55,760,000. On November 30 the silver coinage amounted to \$312,570,999, of which \$60,970,990 were in actual circulation, together with \$237,418,346 in the form of certificates. The suspension of silver coinage is earnestly recommended.

Of more direct interest to manufacturers are the references made to the plans and specifications of the Board of Ordnance and Fortifications, as provided for in the act of September 22 last, calling for forgings for heavy guns and mortars. The bids for the steel forgings are to be opened on December 20, 1888, and for the mortars on December 15, 1888. A board of ordnance officers was convened at the Watervliet Arsenal on October 4, 1888, to prepare the necessary plans and specifications for the establishment of an army gun factory at that point. The preliminary report of this board, with estimates for shop buildings and officers' quarters, was approved by the Board of Ordnance and Fortifications November 6 and 8. The specifications and form of advertisement and instructions to bidders have been prepared, and advertisements inviting proposals for the excavations for the shop building and for erecting the two sets of officers' quarters have been published. The detailed drawings and specifications for the gun factory building are well in hand and will be finished within three or four months, when bids will be invited for the erection of the building. The list of machines, &c., is made out, and it is expected that the plans for the large lathes, &c., will be completed within about four months, and, after approval by the Board of Ordnance and Fortifications, bids for furnishing the same will be invited. The machines and other fixtures will be completed as soon as the shop is in readiness to receive them, probably about July, 1890. Under the provisions of the Army bill for the procurement of pneumatic dynamite guns the necessary specifications are now being prepared and advertisements for proposals will issue early in December. The guns will probably be of 15 inches caliber and fire a projectile that will carry a charge each of about 500 pounds of explosive gelatine with full caliber projectiles. The guns will probably be delivered in from six to ten months from the date of the contract, so that all the guns of this class that can be procured under the provisions of the law will be purchased during the year 1889.

The business methods of the Navy Department have been improved by consolidating the purchasing of supplies under a single responsible head, so that at the present time about 90 per cent. of the total purchases are made by contract and after competition.

The continued growth and prosperity of the country is in nothing shown more forcibly than the statistics of the Post-Office Department, whose revenues have increased from \$19,772,000 in 1870 to \$52,700,000 in 1888, despite reductions of postage which have enormously reduced rates of revenue while greatly increasing its business. Taken together, the reports present a cheerful record, barring the mischievous tendencies of combined capital, the surplus problem and silver glut.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., December 4, 1888.

Pig Iron.—The market remains in much the same condition as reported for some time past, and, so far as can be seen, is neither better nor worse. But it is very dull, and consumers decline to buy beyond what is necessary to carry them to the end of the year. On the other hand, furnaces are so well sold ahead that they suffer no inconvenience from a period of dullness, which is believed to be only temporary. Local brands of standard quality are unusually scarce, so that as far as they are concerned the chance of lower prices appears to be somewhat remote. Other descriptions can be had in moderate quantities at \$16, \$17 and \$18 at tide for the three grades, and if the demand does not soon improve they may possibly be had at slight concessions from these figures, but as yet the quantity is not large enough to cause serious anxiety on that point. Nevertheless, the market is a waiting one, and likely to be influenced by developments within the next two or three weeks, be they favorable or the reverse. As to the probabilities, it is almost impossible to form any decided opinion. The large and increasing output in the face of a dull market usually indicates lower prices, but in the present instance there is the singular accompaniment of comparative scarcity, firmness and increasing cost of production. Ores are scarce and dear, and likely to be still more so, so that to many furnaces it will be impossible to continue making iron, even at present prices, and come out whole. The question of consumption, therefore, is a most important consideration. If consumption can be maintained somewhere near what it has been during the past three months prices of Pig Iron (owing to higher cost, &c.) ought to advance. Should there be even a slight falling off in consumption, it will be impossible to maintain prices with so many furnaces competing for business. As to the chances for consumption it is not easy to form an opinion. For the next month, possibly for a longer period, there is sure to be some shrinkage, owing to the holidays, stock taking, &c., and whether prices will suffer in the meantime is somewhat uncertain. A large business is considered a certainty in many leading departments, but to steadily absorb at the rate of 7,000,000 tons of Pig Iron a year will not permit any important interest to lag very far behind. Considerations of this kind cause buyers to hesitate, and, for the same reasons, sellers are not inclined to force matters, as chances in their favor may be quite equal to those on the other side. Sales in the meantime are at prices varying from \$16 to \$16.50, at tide, for Gray Forge; \$17 @ \$17.50 for No. 2 Foundry, and \$18 @ \$19 for No. 1. A few favorite brands command a premium of 50¢ @ \$1 ½ ton, and by the same rule unknown brands or off grades have to be sold at similar concessions, but for standard qualities prices are steady as above quoted.

Blooms.—There is a good demand and sales are on a somewhat large scale at prices within the limits named, varying with analysis, delivery, &c., say: Steel Nail Slabs, \$29 @ \$29.50, at mill; Billets, from \$32 to \$36, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$42 @ \$44; Scrap Blooms, \$32.50 @ \$34 ½ "bloom" ton of 2464 lb.

Muck Bars.—The market is easier, and, while there is no great pressure to sell, prices have not been fully maintained.

Good qualities command about \$30, delivered, or for deliveries f.o.b. cars; at mill, \$29 @ \$29.50 is generally quoted.

Bar Iron.—The market has not changed appreciably either way. Mills that were a little short of work have, in some instances, quoted low prices to secure orders to run them during the balance of the month, while others have remained firm at the old prices. There is a great deal of work in prospect, and it is thought that several important orders will be taken in the course of a few days, but there are plenty of bidders at 1.7¢ @ 1.8¢ for good qualities of Bars, and 1.85¢ @ 1.9¢ for the best. The store demand is said to be satisfactory, and, on the whole, the outlook is not discouraging. Car builders are again in the market for large lots, but very low quotations are necessary to catch business of that kind. Skelp Iron is dull, although mills are generally full of work for the present, and additional orders could be had for fair sized lots at 1.85¢ @ 1.87½¢, although sellers ask about 1.95¢ for Grooved Skelp.

Plate and Tank Iron.—The demand is fair, and considering the large amount of work in hand manufacturers ought to feel satisfied. Prices are very unremunerative, however, and in bidding for a good-sized order it is necessary to quote very close figures to stand any chance of getting in. But there is a good deal of small work sent in from day to day, so that the average is perhaps better than appears on the face. Quotations are irregular, but in most cases asking prices are as follows: Ordinary Plate and Tank Iron, 2.05¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.25¢ @ 2.3¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—Reports are a little at variance in this department. Some of the large mills appear to have secured additional orders of considerable importance, while others are doing comparatively little. The fact that prices show weakness and irregularity is pretty good evidence that somebody wants business. Quotations nominally as follows: 2.05¢ @ 2.10¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron.—The heavy demand is about over for the season, so that there is only a retail business for the present. Small lots of best makes are quoted as follows:

Best Refined, Nos. 26, 27 and 28....3¼ @ 3½¢
Best Refined, Nos. 18 to 25....3 @ 3½¢
Common, ¼¢ less than the above.
Best Bloom Sheets, Nos. 26 to 28....4¼ @ 4½¢
Best Bloom Sheets, Nos. 22 to 25....4 @ 4½¢
Best Bloom Sheets, Nos. 16 to 21....3½ @ 3¾¢
Blue Annealed.....2.8 @ 3 ¢
Best Bloom, Galvanized, discount.....62½ ¢
Common, discount.....67½ ¢

Merchant Steel.—The demand is not as brisk as it has been, but prices are unchanged, as follows: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Steel Rails.—Business continues dull, and, while prices are probably a little steadier, there is not much disposition to place orders at present. It is understood that \$29 at tide and \$29 at Pittsburgh are the prices agreed upon by the Pennsylvania mills, but it is not unlikely that most of the large orders have been placed, so that only a small business can be expected for the present.

Old Rails.—The market is a trifle easier, although the few in store here are held at high figures. Interior deliveries are quoted \$24.50 @ \$25, but the offerings are somewhat larger, so that buyers are less urgent to place orders, and the general position is hardly as strong as it was a little while ago.

Scrap Iron.—Market somewhat easier, as consumers are not buying to any extent, while the offerings are more liberal than they have been. Nominal quotations are about the same as last week, although the feeling is slightly weaker, at the following prices asked: \$21 @ \$21.50 for cargo lots; \$21.50 @ \$22.50 for carload lots, delivered, or for choice \$23; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$25 @ \$26. Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Nails.—The position does not improve, and while prices are nominally unchanged there are a good many Nails for sale at less than quoted prices, which are from \$1.90 to \$2 for standard makes. Outside lots are offered in carload lots at from \$1.80 to \$1.85, and while they do not meet with much favor they tend to unsettle the market for such Nails as are considered of desirable quality.

Wrought-Iron Pipe.—The market is extremely dull, and to effect sales in quantity very considerable concessions would be necessary. Some of the mills that were unable to make deliveries when the market was in better shape are now overloading the market with goods that ought to have been delivered several weeks ago, hence the weakness. Discounts nominally as follows: Black Butt-Welded, 52½ ¢; Galvanized do., 42½ ¢; Black Lap-Welded, 62½ ¢; Galvanized do., 52½ ¢; Boiler Tubes, 60 ¢.

Mr. Edwin R. Mann, 147 South Fourth street, Philadelphia, has been appointed sales agent for the Acme Low Phosphorus Pig Iron, made at the Norristown Furnace. This Iron is made from special foreign Ores, and is expected to meet the needs of manufacturers of the finest grades of Steel.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, December 3, 1888.

The condition of trade in numerous lines has been somewhat disappointing during the past week. Hence an outcropping of bearish sentiment is noticeable, and predictions of lower prices are frequent, especially among those whose interests are directly connected with the cruder forms of Iron or Steel. This is traceable not so much to the attempts of manufacturers to force trade as to the shrinkage in the demand. It is argued that if buyers hold off for even a short time there will be such an accumulation of stocks in makers' hands, or such a cleaning up of orders, that manufacturers will make vigorous efforts to secure business, with, of course, the usual result. On the other hand, there are reasons for taking a cheerful view of the situation, which are not wholly disregarded by watchful buyers. This being the time of the year when trade is usually very dull, the present quietude is not particularly ominous. Should it extend into January, good reason for apprehension would then exist. The railroad companies are still buying cars, orders for several hundred having been placed last week, and 2000 more will be purchased this week. The demand for iron in that quarter will be large. It will be still larger if the Western railroad companies are able to agree upon a plan which will not only put a stop to their reckless competition with one another, but will enable them to establish remunerative freight rates. The effective settlement of the railroad problem would radically change the condition of business in very many branches of the Iron trade. While the situation is unsettled in Crude Iron and heavy forms of Iron and Steel, the reverse

is the case in manufactured products. The manufacturers of Steel goods, such as are handled by the Hardware trade, are getting matters in shape preliminary to an advance in prices. Steel Nail manufacturers, having sounded the lowest depths, now have hopes of better times. The Barb Wire trade will probably be the next to follow. Those in a position to test the course of the current are anticipating an advance in Screws. Another twist upward is to be made in Nuts. As the demand for Hardware is very active at present, these expected advances may be sustained, at least until another dull period intervenes.

Pig Iron.—The volume of business declined last week as compared with the preceding week. An increased quantity of Strong Coke Foundry Pig was sold, and the prospects are bright for considerably larger transactions in that line, but for other kinds the demand was very light. The Calumet Furnace and the remodeled Bay View Furnace were blown in last week to make Pig Iron for the general market, and the prospective addition to the local supply from those furnaces has had a weakening effect on prices, but not decided enough to cause a change in quotations. It is asserted that the Jackson County furnace companies are selling very little, if any, Iron in this market at their advanced price, other Soft Ohio Irons which are available at \$17.50 @ \$18 receiving the preference at the lower rates. Southern Coke Iron is very quiet at present, the higher prices asked for low grades being due to the demand for them in other markets. The large orders expected for Lake Superior Charcoal Iron have not yet been placed, but they cannot be deferred long, in view of the past and prospective orders for cars. Some complaint is made on the score of collections from the general foundry trade, which is an element of discouragement that has quite recently made its appearance. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, Nos. 1 and 2, \$20; Nos. 3 to 6, \$20.50 @ \$21; Alabama Car Wheel, \$26.25; Jackson County Softeners, No. 1, \$18.60; Hocking Valley Soft Foundry, No. 1, \$17.50 @ \$18; American Scotch (Blackband), No. 1, \$19.50 @ \$20.50; other Ohio Soft Irons, No. 1, \$17.50 @ \$18; Lake Superior Coke, No. 1, \$18 @ \$18.50; No. 2, \$17 @ \$17.50; No. 3, \$16 @ \$16.50; Coke Bessemer, \$17.50 @ \$18; Southern Coke, No. 1 Foundry, \$17.25; No. 2 Foundry and No. 1 Soft, \$16.75; No. 3 Foundry and No. 2 Soft, \$16.50; Gray Forge, \$16.

Bar Iron.—More good orders from manufacturing consumers are in the market, including some from car builders. The Pennsylvania Company will open bids for 2000 cars on the 7th inst. The Bar Iron manufacturers are still maintaining a firm front and quote full prices for deliveries next year, but some of them are now offering to make very prompt shipments, showing that they are not so well supplied with work as they have been. They quote 1.72¢ @ 1.75¢, half extras, for Common Iron, f.o.b. Chicago, and ask 50¢ @ \$1 per ton more for Car Iron, although merchants are able to do somewhat better in placing assorted orders. Small lots from store are now selling at 1.90¢ @ 2¢, according to quantity and quality, with stocks in warehouses badly broken.

Structural Iron.—Although plenty of work is in prospect it is taking shape very slowly, so that the past week has been exceedingly quiet. Mill orders can be placed at the following rates, f.o.b. Chicago: Angles, 2.15¢; Universal Plates, 2.20¢ @ 2.25¢; Tees, 2.55¢ @ 2.60¢; Beams and Channels, 3.40¢. Store prices for small lots are unchanged at 2.35¢ @ 2.50¢ for Angles, 2.60¢ @ 2.70¢ for Tees, and 3.80¢ for Beams.

Plates, Tubes, &c.—There is a notable lack of large orders for Plates, but a very active business is still being done in small lots, which are needed for marine repair work. Store prices are very firm. Boiler Tubes are weaker from mill, but with small stocks here prices are well maintained on store lots. Quotations on small lots from store are as follows: Heavy Sheets, Nos. 10 to 14, 2.60¢ @ 2.70¢; Tank Iron, 2.55¢ @ 2.65¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron, 4.25¢; Flange Steel, 3.75¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢. Boiler Tubes, 60¢ off.

Sheet Iron.—The demand from store is very heavy, jobbers generally reporting an excellent trade. They quote small lots at 3.10¢ for No. 24; 3.20¢ for Nos. 25 and 26, and 3.30¢ for No. 27. Mill lots are selling on a basis of 3¢ at mill for No. 27, but on large orders or favorable deliveries this price would be slightly shaded.

Galvanized Iron.—Jobbers' stocks are as badly broken as ever, while the demand keeps up from all classes of consumers. Small lots are selling at 60¢ and 5¢ off on Juniata, and 60¢ and 10¢ off on Charcoal.

Merchant Steel.—A quiet week is reported in this line. Prices are now very much unsettled in Bessemer Bars, and it is impossible to make a quotation, as each transaction is conducted on an independent basis. Store prices are as follows: Tool Steel, 8.50¢ @ 9.50¢; Specials, 13¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢ @ 2.75¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—The situation as to prices is not so demoralized as the daily papers allege. The parties in interest will endeavor to sustain the old rate of \$30 here and \$28 at Pittsburgh, and it looks as if they will succeed. Business is not very heavy, but the local mills are picking up small orders every week. Last week they booked something over 5000 tons, mainly for delivery next year. Orders for a considerable quantity are now in the market from the Southwest.

Old Rails and Wheels.—The condition of the Old Iron Rail market is perplexing. A sale of 1000 tons was made to a local consumer at \$23, and another lot of 1000 tons is reported to have been sold at \$23.50. At the same time a considerable quantity has been secured at \$22 @ \$22.50, delivered at Milwaukee, from the Northwest, and the Mahoning Valley mills seem to be able to get a supply of Rails from other points at the equivalent of \$22.50 here. Sellers insist that \$23 @ \$23.50 should be the Chicago quotation, as the supply is limited. Car-Wheels are quiet and nominally quoted at \$19.50.

Scrap.—General business has been very quiet, particularly in No. 1 Forge. Some 200 tons of Mill Iron were sold for \$16, and a large quantity of Mixed Steel was disposed of at \$12.50. Cast Scrap is utterly lifeless. Some strictly No. 1 Railroad Cast was offered at \$14 without takers. Mixed Country Scrap is quoted at \$14 @ \$15. The railroads are offering considerable quantities of Scrap for sale. Dealers' prices for selected Scrap are as follows, per ton of 2000 lb: No. 1 Forge, or Railroad Shop, \$20.50 @ \$21; Track Scrap, \$19.50 @ \$20; Fishplates, \$22; Horseshoes, \$20; Axles, \$26; No. 1 Mill, \$15.50 @ \$16; Pipes and Tank, \$13.50; Light Wrought, \$10; Cast Machinery, \$13.50 @ \$14; Stove Plate, \$11.50; Cast Borings, \$9 @ \$9.50; Wrought Turnings, \$11; Axle Turnings, \$13.50 @ \$14; Coil and Leaf Steel, \$17; Locomotive Tires, \$16.

Hardware.—The demand for Shelf Hardware continues very strong, the

Thanksgiving holiday having made a break merely in interrupting the work of getting out orders and throwing a heavy press of business on the latter part of the week. The demand is very general, but at the same time it is running largely into Shelf Goods. Shot has declined further to \$1.10 regular. No other change in prices worthy of mention has been made, but there is a probability of higher prices in a number of lines. The manufacturers of Steel Goods issued a notice requiring specifications to be sent in before December 1 on all unfilled contracts, or they would be canceled at that time. This is regarded as preliminary to an advance in price. Screws are very firm, and the trade now seems to be in shape to sustain an advance. Nuts are to be marked up very soon. The Tackle-Block manufacturers have also about adjusted their differences, which will correct irregularities in price. Heavy Hardware is quiet and without special feature.

New Car Axles.—The manufacturers of Car Axles have agreed to advance the price of Common Axles to 2.20¢.

Nails.—Heavy quantities of Steel Nails are now being sold by the manufacturers whose prices come nearest to buyers' views, and jobbers here and at points further West are laying in good stocks. As far as can be ascertained manufacturers are refusing to quote on deliveries next year, but are only selling for immediate or early shipment. It is reported that arrangements will probably be completed by the middle of the month for a combination of the Wheeling and other Ohio River manufacturers, when prices will be advanced. A guarantee fund is to be put up by each manufacturer, to be forfeited in case of cutting. The Wheeling manufacturers have given up for the present the hope of establishing a national pool, and, as the bulk of the Steel Nails produced in the country are made in the Ohio River Valley, they will try the experiment of controlling prices there, in the belief that some benefit can thus be obtained. Prices now are undoubtedly below cost, and this is a very good time to arrange for an advance in anticipation of the spring demand. The Chicago and Southern Illinois manufacturers have agreed to co-operate with the Ohio River manufacturers in sustaining prices, although they have not joined the combination. They are heartily tired of the unsatisfactory situation of the Steel-Nail trade, and assert their intention to do their utmost to improve it. Small lots of Steel Nails are still being sold at \$1.95 @ \$2 from store, and \$1.90 for carloads on track, but large lots are 10¢ lower. Wire Nails are a shade lower, being now obtainable at \$2.55 in small lots, but if Steel Nails advance they will also firm up again.

Barb Wire.—The demand is a little better. A noticeable feature of the current business is the occasional receipt of an order for a considerable quantity from merchants who write that they are buying it not to meet their immediate wants, but because they consider it cheap, and therefore good stock to hold until the spring demand sets in, if, indeed, the manufacturers do not advance the price in the meantime, in which case the purchase will be a still better one. Some manufacturers are already asking a better price, believing that the outlook warrants it. Small lots are unchanged at 2.90¢ for Painted and, 3.60¢ @ 3.65¢ for Galvanized, with the usual difference for carloads.

Pig Lead.—This market has been very active for the past few days. Over 900 tons of Common and Corroding Lead were sold to consumers for delivery this month and next, at prices ranging from 3.42¢ to 3.55¢ at the close, the greater portion going at 3.50¢.

Geo. S. Hall & Co. succeed W. S. Kessler & Co. as Western sales agents of the Toledo Bolt and Nut Company. Their office will continue to be at 115 Dearborn street, Chicago, Room 53. Mr. Hall was formerly a partner of Mr. Kessler, who has retired from this firm to engage in another line of business.

B. L. Keen & Co., manufacturers' agents for the sale of Bar Iron, Steel, Beams and Channels, Railway Supplies, &c., have removed from 184 Lake street to Room 545, Rookery Building, Chicago.

The Allegheny Bessemer Steel Company, of Pittsburgh, have appointed B. B. Kerr Western agent for the sale of their Steel Rails. Mr. Kerr is well acquainted with the railway fraternity, having been connected with Pettibone, Mulligan & Co., of Chicago, for the past six years, handling railway supplies. His office for the present will be located at 243 Lake street, Chicago.

The Chicago Crucible Steel Casting Company have established city offices in a fine suite of rooms on the second floor of 154 and 156 Lake street, Chicago.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, December 3, 1888.

Pig Iron.—The tenor of the local Pig-Iron market has changed but little during the week under review, but there has been a less heavy business, although the market has been by no means dull. A strong tone has prevailed and full prices have been realized. Southern furnaces, being so largely sold ahead, have figured less prominently, while Ohio and Pennsylvania Irons have sold more readily. The curtailment of production to some extent in Jackson County Irons has resulted in higher prices for some grades. The demand has continued to be largely for Mill grades, but there have been larger inquiries for Car-Wheel, Mottled, White and "off" grades of both Mill and Foundry make. Some of the local houses have experienced during November the heaviest month of their history, but this has been due to exceptional conditions and is not indicative of the trade at large, but reflects rather the entrance of new capital into the Iron interest. Among the sales have been 1200 tons Southern Car-Wheel Iron for delivery next year at the rate of 200 tons per month at outside quotations. Sales of Mill grades are reported in lots of 700, 3000, 1000, 2000 and 500 tons, and Foundry grades in lots aggregating 4000 tons. One contract for 12,000 tons Cold Forge Iron is about to be closed to-day between \$14.25 and \$14.50 per ton. The following are the approximate quotations for the local market, cash, f.o.b. Cincinnati:

Foundry.

Southern Coke, No. 1 (new classification).....	\$16.25 @ \$16.75
Southern Coke, No. 2 (new classification).....	15.50 @ 16.00
Southern Coke, No. 3 (new classification).....	15.00 @ 15.25
Ohio Soft Stone Coal, No. 1.....	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.00
Mahoning and Shenango Valley.....	18.00 @ 18.50
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.50
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2.....	17.50 @ 18.00

Forge.

Strong Neutral Coke.....	15.00 @ 15.25
Mottled Neutral Coke.....	14.00 @ 14.25
Gray Forge.....	14.50 @ 14.75

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	21.00 @ 22.00

Old Material.—There has been a little stronger tone prevailing for both Old Rails and Wheels under moderate offerings, and

a better demand; 400 tons Old Rails sold at \$19, cash, here and Old Wheels have sold at \$23, spot, cash.

Manufactured Iron.—There has been a fair volume of business during the week and a firmer tone has prevailed. Common Bar Iron, 1.90¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ per lb.

Nails.—The market has remained steady, with a moderate jobbing trade. Jobbing prices are based upon 12d @ 40d, which sell at \$1.95 per keg, with 10¢ rebate in carload lots, at mills. Steel Nails sell at \$1.95 and Steel Wire Nails at \$2.65 per keg.

Louisville.

LOUISVILLE, KY., December 3, 1888.

Pig Iron.—The market has been quiet during the week, and sales only in small quantities have been effected. There is a disposition to make slight concessions to buyers for large quantities, and it is thought that prices will improve after the first of the year, as at present there are few buyers who desire to make purchases for future delivery until after they have taken stock and this year's business is closed up. We think the weakness of the market is attributed to the close of the season rather than to large quantities of Iron being offered, as Southern furnaces are well sold up, and very little Iron is offered by furnaces that were expected to have been in blast before this. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$16.50 @ \$17.00
Southern Coke, No. 2 Foundry, new classification.....	16.00 @ 16.50
Southern Coke, No. 3 Foundry, new classification.....	15.50 @ 16.00
Gray Forge.....	15.00 @ 15.50
White and Mottled, different grades.....	14.00 @ 14.50
Silver Gray, different grades.....	15.50 @ 16.50
Southern Charcoal, No. 1 Foundry.....	17.75 @ 18.25
" " No. 1 Mfl.....	16.00 @ 17.00
Southern Car-Wheel, standard brands.....	22.75 @ 23.75
Southern Car-Wheel, other brands.....	19.00 @ 21.00
Hanging Rock Coke, No. 1 Foundry.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1 Foundry.....	20.75 @ 23.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Hanging Rock, Warm Blast.....	19.00 @ 20.00

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, December 4, 1888.

The general Iron situation remains much the same as noted in our report of a week ago. December is usually a dull month, when buying is done sparingly, so that the year may be closed with as little stock as possible.

Pig Iron.—A fair degree of activity prevails, although there is not the volume of business there was some time ago. Consumers generally are pretty well covered for the rest of the present year, and furnacemen are well sold up; some of them will be off the market not only for this month, but for two or three months, having contracts sufficient to absorb their entire production during that time. It is intimated, however, that there is a disposition on the part of some furnacemen to talk bearishly in order to beat the Ore market, as the time is now approaching when it is customary with many of them to make contracts for Ore; it is not uncommon for some furnacemen to contract in January for a year's supply of Ore to be delivered along as they need it, and they strive to get the market for Ore down to the lowest point possible before they buy. It is doubtful whether as large contracts for Ore will be made as formerly. It is probable a good many furnacemen will feel more like buying as they need it in preference to contracting for a six or twelve months' supply. However this may be, some fur-

nacemen are refusing to contract for future delivery at present time, and the outlook generally warrants the belief that there will be a good healthy market for some time to come. We quote prices for immediate or near-by delivery as follows:

Neutral Gray Forge.....	\$15.75 @ \$16.25, cash.
All Ore Mill.....	16.75 @ 17.00, "
White and Mottled.....	15.00 @ 15.25, "
No. 1 Foundry.....	18.00 @ 18.50, "
No. 2 Foundry.....	17.00 @ 17.50, "
No. 3 Foundry.....	16.50 @ 16.75, "
No. 1 Charcoal Foundry.....	21.50 @ 24.00, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal.....	25.00 @ 28.00, "
Bessemer Iron.....	17.25 @ 17.50, "

Included in the sales reported were several thousand tons of Gray Forge at \$16, cash, 1000 tons at \$15.75, cash, and some smaller lots at \$16.15 @ \$16.25.

Muck Bar.—There is still considerable inquiry for immediate delivery, and, with but little offering, the market may be quoted at \$29 @ \$29.50, cash, with a sale of 1000 tons reported on January delivery at \$29.60, cash. So far as your correspondent can learn there have been no actual sales above the prices quoted.

Spiegel.—Is quoted at \$27.50 @ \$28 for 20 %, cash, and Ferromanganese at \$56.50 @ \$57, cash, for 80 %.

Manufactured Iron.—The demand is not as active as it was a month or more ago, but the mills are still pretty fully employed in working old contracts. There is not the inquiry for Skelp Iron that there has been, but it always drops off this month, if not before, and the effect will be to increase the capacity for making Merchant, as those mills making a specialty of Skelp and doing but little else since early in the summer will now be wanting orders for any kind of Iron they can make in order to keep their mills going. Prices remain as last quoted: Bars, 1.80¢ @ 1.85¢; Plate, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; all 60 days, 2 ¢ off for cash. Skelp Iron is weaker, but may still be quoted at 1.85¢ @ 1.90¢ for Grooved, and 2.10¢ @ 2.12½¢ for Sheared.

Nails.—There is no improvement to report in the Nail trade, and not likely to be until toward spring. Pittsburgh manufacturers are still asking full card rates upon a basis of \$1.90 for 12d @ 40d, 60 days, 2 ¢ off for cash, but they are not able to effect sales, nor is it to be expected, as long as they can be bought from 25¢ to 30¢ less per keg elsewhere. Pittsburghers say they prefer to let their factories stand idle to running them at a loss, and they claim that even at the full card the margin for profit is small. In regard to the price for the 10,000-keg order recently placed in the Wheeling district, we learn authoritatively that it was \$1.66, net, cash, showing that the report made in regard thereto in *The Iron Age* two weeks ago—\$1.65 net, cash—was not far from the mark.

Wrought-Iron Pipe.—The demand continues light, as it always is at this particular time, and no improvement can reasonably be looked for until toward spring; trade is nearly always light during the winter season, and the Pipe mills will no doubt curtail their production considerably for some time to come. Prices remain unchanged. Discounts on Black Butt-Welded Pipe, 52½ ¢; on Galvanized do., 45 ¢; Black Lap-Welded, 62½ ¢; on Galvanized do., 52½ ¢; Boiler Tubes, 60 ¢; 2-inch Tubing, 13¢ per foot, net; 5½-inch Casing, 40¢ per foot; all in large lots.

Old Rails.—Sales of American Tees at \$25 @ \$25.25, at which price the market is fairly active and steady. Now that the cold weather has set in the work of lifting will soon be very much curtailed, if not suspended, and a firmer market is not unlikely.

Steel Rails.—Heavy sections are still quoted at \$28 @ \$28.50, cash, at mill, and while the market is reported firmer it is said that there is no difficulty in placing desirable orders at \$28. The new mill of the Allegheny Bessemer Steel Company will not be ready to start for some time to come, although the company have booked some orders.

Billets, &c.—Bessemer Steel Billets are quoted at \$28.50 @ \$28.75, cash, at makers' mill, and ditto Nail Slabs at \$28 @ \$28.25. Some of the mills, including Carnegie, Phipps & Co. and Park Bros., have large contracts for Ship Plates. Domestic Rail Crops may be quoted at \$19.50 @ \$20; sale of 1000 tons Domestic Bloom Ends at \$19.50.

Railway Track Supplies.—Spikes are still quoted at \$2.20, 30 days, but this, we believe, means delivered where the freight rates do not exceed 10¢ @ 15¢ @ 100 lb; brokers report sales at 2.05¢ f.o.b. cars, Pittsburgh. Splice Bars remain unchanged at 1.85¢ @ 1.90¢, and Track Bolts at 2.85¢ with square, and 2.95¢ with square and hexagon Nuts.

Old Material.—There is a fair business, but prices remain unchanged. Sales No. 1 Wrought Scrap at \$21 @ net ten; Wrought Turnings, \$13 @ \$14; Car Axles, \$25.50 @ \$26.50; Old Car-Wheels, \$20 gross; Cast Scrap, \$15.50 @ \$16. Sales short pieces Steel Rails at \$18.50; Open-Hearth Scrap Steel, \$18.50 @ \$19.25.

Naylor & Co., of 99 John street, announce that they have opened an office in the Lewis Block, where they will receive inquiries and orders for domestic as well as imported Iron, Steel and Metals. They suggest that their customers west of the Allegheny Mountains correspond with their Pittsburgh office.

Detroit.

WILLIAM F. JARVIS & Co., under date of December 3, report as follows: The market is more active than it has been for the past month, and a number of buyers are casting about for round lots of Car-Wheel and other grades, but sellers are generally holding firm at present prices and there is a strong upward tendency. There is usually an active trade in December, and from the inquiries received from different parts of the country it looks as if this month would be an exceptionally good one. Numerous small orders have been placed, and some of considerable magnitude. Car-Wheel Irons are most in demand, but a good trade is being done in the best brands of Mahoning Valley Coke Iron, with a few good sales of Southern. We report an active market and quotations as follows:

Lake Superior Charcoal, all numbers.....	\$20.00 @ \$20.50
Lake Superior Coke, all ore.....	19.75 @ 20.25
Lake Superior Coke, cinder mixed.....	18.50 @ 19.00
Standard Ohio Black Band.....	19.75 @ 20.25
Southern No. 1.....	17.75 @ 18.25
Southern Silvery.....	17.00 @ 17.50
Southern Gray Forge.....	16.25 @ 16.75
Jackson County (Ohio) Silvery.....	18.50 @ 19.00
Old Wheels.....	20.50 @ 21.50

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, December 5, 1888.

Pig Iron.—The local market is without any new features, except that consumers are, on the whole, showing considerable apathy, while some sellers are not quite so confident as they have been lately. On the whole Southern furnacemen are those who are most enthusiastic on the future, and are acting up to their convictions by declining to sell for longer delivery than the first quarter of 1889 at any notable concessions. Some agents report that they are making deliveries now which were delayed in the past, when they substituted other Irons. Our blast-furnace returns are

not yet sufficiently complete to enable final figures to be presented thus early in the month, but the reports thus far indicate a further increase. Among the furnaces which have blown in during November and early in December we may name two Hudson, one Troy, in New York; Union, in the Upper Susquehanna district; a second Allentown, in the Lehigh Valley; Mount Laurel, in the Schuylkill Valley; Spearman and Stewart, in the Shenango Valley; the new Cameron, at Emporia, Pa.; the second Cherry Valley, in Ohio; Akron, one Floodwood and one Fannie, in the Hocking Valley; one Union and Calumet, in Chicago; the remodeled Bay View, at Milwaukee; a third Ensley, at Birmingham and No. 3, South Pittsburg, Tenn. Merion and Montgomery, in the Schuylkill Valley, are to blow in soon, and the first of the famous new plant of the Pennsylvania Steel Company, in Maryland, is soon to be ready. Against this we can only enumerate the blowing out of one of the Lock Ridge furnaces of the Thomas Iron Company; of one of the Bethlehem plant; of the Lebanon Valley, which is to resume on the 18th of this month, and of one of the Bird Coleman furnaces. We continue to quote Standard to Choice No. 1, \$18 @ \$19; No. 2 Foundry, \$17 @ \$17.50, and Gray Forge, nominally, \$16 @ \$16.50.

Scotch Pig.—The market is weaker. We quote: Coltness, \$21, nominally; Shotts, \$20.25 @ \$20.75; Langloan, \$20.50 @ \$21, and Dalmellington, \$19.50 @ \$20.

Spiegeleisen.—We quote nominally \$27 for German 20 % Spiegeleisen, and \$54 for Ferromanganese, 80 %, prompt delivery.

Plates.—We quote Iron Tank, 2.1¢ @ 2.2¢; Shell, 2.3¢ @ 2.4¢; Steel Tank, 2.2¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3.5¢ @ 4¢.

Structural Iron.—It is reported that very low prices are being made by at least one Western producer in Plates and Structural Iron and Steel, with the exception of Beams, the evident purpose being to keep a large capacity employed. Still, there is considerable work coming up, one Eastern mill reporting that in one day they put in bids for \$450,000 of bridge work. We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2.1¢ @ 2.15¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 3.3¢. Foreign Beams are 2.65¢ @ 2.75¢.

Bar Iron.—We quote: Carload lots, half extras, Common; 1.70¢ @ 1.75¢; Medium, 1.75¢ @ 1.8¢; Refined, 1.8¢ @ 2¢.

Steel Rails.—The situation is not quite clear. There have been no large sales in the East which may serve as the basis of quotations, nor is there any business of any consequence in sight. The Eastern mills are cut out of the Western market entirely, and while low prices are being made in the West, they are being underbid in the South, which is the only territory of any consequence in which they can hope to place much tonnage. Facts are constantly cropping up which prove how low prices went two weeks since. Thus, a large order was placed for delivery at Omaha at \$30.50, which would be equivalent to about \$25 at Pittsburgh. In the last week sales have been made by Pittsburgh and Chicago mills, aggregating about 30,000 to 35,000 tons, and additional orders are in the market, including a large block for a Southwestern system. The prices at which these sales were made are not given out, but it is claimed that an advance over the lowest was realized. The reports of an agreement among the Western mills are without any foundation, the only fact giving color to it being the alliance of the Chicago mills, which will have the good effect, at least, of narrowing down the

number of contestants. To this must be added the fact that for the present, at least, the new Pittsburgh mill has withdrawn from the market on everything but small lots for convenient delivery. As many large orders have been taken by it as its managers deem expedient until they know definitely when they will again work, and how soon they will overcome the hitches which invariably accompany the starting of any great manufacturing plant. The personal element enters so largely into shaping the policy of the near future, so far as the Western mills are concerned, that any moment may bring the demoralization to a close, if in fact that time has not already come. It is asserted that to-day \$29 is the bottom at Chicago, and \$28 at Pittsburgh, and it is possible that some of the quotations cited to controvert that statement were made prior to last week. The losses entailed by the low figures at which Rails have been sold are so heavy that they are not likely to rule long in any case. They may or may not be a thing of the past before this report reaches our readers. It should be remembered that the number of active competitors has narrowed down very considerably. Four Eastern mills and two Western concerns are turning their Steel product into other channels, two mills have booked enough Rails to keep them out of the market for the present, and two are entirely idle. We discuss the situation editorially.

Slabs and Billets.—Although there has been a slight weakening in Slabs and Billets, it has not been so much as may have been expected in view of the recent demoralization in Steel Rails.

Merchant Steel.—Well authenticated reports indicate that the prices fixed by the Merchant Steel Association have been sharply cut, and that the combination is practically inoperative. Agricultural and Merchant Steel have been sold at low prices for 1889 delivery.

Old Rails.—Outside of one sale of 700 tons at private terms there has been no business. We quote, nominally, \$23.25 @ \$23.50.

Financial.

Cuts in railroad tariffs, gold exports, a decreasing bank surplus and contradictory reports respecting conferences among railroad managers have had an unsettling effect in monetary circles, and have not been without their influence in some departments of business. The prevailing feeling is the improbability of an early adjustment of differences respecting freight charges, owing to the refusal of railway lines in the Northwest to enter into the clearing-house plan favored by several of the Southwestern roads. Nevertheless, there are signs of progress. The railroads that are members of the Central Traffic Association were notified on Monday that on December 17 they must, in accordance with action taken by the association at Chicago on Saturday, advance rates on east-bound freight to a basis determined by an advance in the rates between Chicago and New York, as follows: Grain, from 18¢ to 25¢ @ 100 lb; provisions, 25¢ to 30¢; live stock, 15¢ to 22½¢, and dressed beef, 35¢ to 50¢ @ 100 lb. The Grand Trunk is allowed a differential rate of 45¢ @ 100 lb on dressed beef via Montreal, the Chicago and Atlantic also a 45¢ rate, and the Wabash, and "Nickel Plate" roads a differential of 48¢ @ 100 to New York and Boston. It is understood that this advance will be followed by a restoration of west-bound rates to the figures that were scheduled before the New York Central made its wholesale reduction two weeks ago, but respecting this last supposition there is room for conjecture. Nor is there much hope of relief from the Interstate law.

The Transcontinental Association before adjourning agreed upon a system of graded rates on the traffic to the Pacific Coast. The highest class differential rate in favor of Chicago will be 3¢ less than from New York, while the lowest class rate will be 10¢ less. The St. Louis rate will be 99 % of the Chicago rate; Missouri River rates, 50 %; Buffalo and Pittsburgh, 20¢ less than New York on first class and 5¢ on the lowest class; Cincinnati, Toledo and Detroit, 25¢ less than New York on the highest class and 5¢ on the lowest. Commissioner Fink said that, with the exception of a few details that remained to be arranged, all matters connected with fixing the rates have been practically settled.

Weakness in the Stock Exchange markets was more pronounced. On Friday Lake Shore was a prominent feature, in anticipation of the agreement to advance rates on Eastern business. An unfavorable influence was a sharp break in copper stocks. On Saturday, despite the improved trunk line situation then announced, a selling movement carried the whole list downward. The free sales were attributed to reported difficulties in the Southwest, arising from failure to obtain the assent of a majority of stockholders in the various lines to the clearing-house plan. On Monday there was a drop in Atchison, Topeka and Santa Fé, also a break in New England, coupled with reports of financial trouble in Boston, and the coal shares were weak, owing to orders for restricted production at the mines. On Tuesday a fall in Atchison, Topeka and Santa Fé and in Missouri Pacific had an unsettling effect and the market became feverish. The injunction suit of the Oregon Transcontinental Company against the Oregon Navigation Company was decided in favor of the plaintiff. This decision compels the cessation of construction on the part of the Oregon Railway and Navigation Company and the Union Pacific of lines in Washington Territory competing with the Northern Pacific.

According to the Custom House report the exports of specie from this port during the week were \$2,333,000; total since January 1, \$38,065,000, of which \$12,000,000 is silver, as compared with \$16,988,000 for the same time in 1887. The imports were \$142,000, and since January 1 \$6,989,000, against \$39,283,000 for the same time last year.

The imports of merchandise at this port during the week amounted to \$7,841,000, and the total since January 1 is \$427,761,000, as compared with \$432,979,000 for the same time last year. The exports were valued at \$6,288,000, and included 56,000 packages flour, 586,000 bushels of corn, 31,400 bales of cotton and 10,500,000 gallons of oil. Total exports since January 1, \$274,871,000, against \$287,977,000 for the same time last year.

Government bonds were dull but firm. Quotations as follows:

U. S. 4s, 1891, registered.....	108
U. S. 4s, 1891, coupon.....	108
U. S. 4s, 1907, registered.....	127½
U. S. 4s, 1907, coupon.....	128½
U. S. currency 6s.....	118

The gross exchanges of 40 cities for the week ended with December 1 showed a decrease of 17.5 % compared with last year. Outside of New York the decrease is 14.4 %. New York decreased 19.1 %, Boston, 7.7 %, Philadelphia, 21.1 %, Chicago, 27.5 %, St. Louis, 13.9 %, San Francisco, 14.2 %, Baltimore, 19.1 %, Cincinnati, 11.8 %, New Orleans, 25.4 %, Duluth, 50.2 %, and Los Angeles, 56.2 %. Kansas City increased 12.4 %, Memphis, 23.9 %, and Topeka 29.1 %. The clearings of 37 cities for the month of November decreased 4.5 %.

In the general markets trade was slow, but, allowing for holiday interruption, the volume of business was fair. On the Produce Exchange prices were inclined to

drop. A break in spot wheat on Monday of 2½¢ a bushel, caused by a large increase in the visible supply, was followed by depression in breadstuffs, and there was more export at the decline. Lisbon took out of this market on Friday 72,000 bushels wheat, the first export trading of consequence in a long while. Foreign markets are still 5¢ @ 10¢ below New York. Cotton was unsettled, with sales of spot limited to special orders. Coffee tends upward, with some excitement. Provisions are irregular, as packers are hammering the market. A new lard refinery in this city is talked about. Dry goods jobbers notice a fair demand; prices generally firm. The result of the action of the Liverpool Salt Trust in advancing prices about 25¢ per sack is lighter importations here on fresh purchases. The weekly bank statement showed a decrease of \$2,235,325. This makes the surplus now held \$10,076,550, against \$5,845,725 at the corresponding time last year and \$6,165,950 in the first week of December, 1886. In spite of the heavy decrease in the reserve the comparison with the figures of preceding years is still favorable. The loans show a gain of \$590,200; specie is decreased \$4,872,900; the legal tenders are up \$1,643,200. The money market has been free from disturbance and the ruling rate on call is still 2½ %. The demand is comparatively limited owing to dullness in the speculative markets. The currency movement also tends to keep rates low. There was a marked falling off in the exports of specie and exchange on London weakened. A favorable indication is the increasing exports of cotton. The interest payments December 1 on \$570,608,963 of bonds amounts to \$14,972,327, and the dividend payments on \$337,609,628 of stock amounts to \$6,228,855; total payments, \$21,201,182, for an off month.

E. E. Gedney was appointed to the presidency of the North River Bank to succeed Levi Appar, deceased, and Daniel Barnes succeeds the late Henry P. Marshall as cashier of the Seamen's Bank for savings.

The Empire State Bank, James W. Conron, President, corner of Broadway and Bleeker street, commenced business yesterday.

Coal Market.

The Anthracite Coal trade is dull in wholesale lines, as little eagerness to buy is manifest in the presence of ample supplies. The Coal producers, in deciding between the alternatives of lower prices or lessened production, are resolved to restrict the output at the mines, beginning December 1. The Reading Coal and Iron Company, on Saturday, shut down some 18 collieries, besides reducing the working hours at the others to three-quarters time. At a meeting of sales agents in this city, on Tuesday, while no formal action was taken, probably for prudential reasons, a tacit understanding is supposed to have been reached, recognizing the necessity for restriction. Contrary to anticipations, the production for the week ending December 1 is only 50,000 tons less than for the previous week, scarcely reflecting the Thanksgiving-day interruption, the total being 780,015 tons, as compared with 770,845 tons for the corresponding week last year. The aggregate since January 1 is 35,528,753, against 31,981,628 for the same time in 1887, an increase of 3,545,000 tons. Quotations remain as before, but actual sales are said to range from 25¢ to 50¢ below the schedule: Hard White Ash, Lump, \$4.50; Broken, \$4.15; Egg, \$4.40; Stove, \$4.65; Chestnut, \$4.55; Free-Burning, f.o.b., Broken, \$3.95; Egg, \$4.30; Stove, \$4.65; Chestnut, \$4.65; Pea, \$2.75.

Bituminous Coal is in good supply, only temporary embarrassment having been caused by the loss of Coal-laden barges in the bay, and prices are still based on the pool figures, \$3.25, f.o.b. Cumberland reports for the week 76,522 tons and Clearfield 78,700 tons.

The Pennsylvania Railroad reports for the week 252,000 tons of Coal and 99,867 tons of Coke. Reading's shipments were 166,000 tons, of which 58,000 went to Port Richmond and 7000 to Port Liberty.

A new railroad is projected between Scranton and Forest City, 22 miles long, designed to connect with the line at Binghamton, and is understood to be backed up by the Central New Jersey and Lehigh Valley railroads. The Delaware and Hudson Canal Company broke ground for a new mine in Forest City on Monday.

Freights to Boston are quoted \$1.101, with less demand.

Metal Market.

Copper.—The London market has again come lower since our last week's report, spot Chili Bars declining from £77. 17/6 to £77. 10/, futures from £78. 5/ to £78, and good merchantable brands from £77. 17/6 to £77. 10/ for spot, futures being £78 and Best Selected £82. Sales, 550 tons. The fire which broke out at the eighth level of No. 3 shaft of the Calumet and Hecla mine on the morning of November 30 was at latest accounts still burning, but even if the stoppage at that point be long the decrease in production will probably not exceed 10,000,000 to 15,000,000 lb during a twelvemonth, hence the little effect this incident has exercised in England and here. The visible supply in England and France is, indeed, swelling so fast that it overshadows everything, being on December 1 95,790, against 91,740 tons on November 1 and 45,130 on December 1, 1887. Adding to the above the about 30,000 tons accumulation of Copper on this side, including large stocks at New Orleans, and it will be seen that some 120,000 to 125,000 tons are thus set aside to maintain prices. And this at a moment when the Panama Canal Company seems to be breaking down and causing great uneasiness in financial circles in Paris. Later advices from the Calumet and Hecla are more reassuring; the temperature at the surface is decreasing and an early resumption of work expected. It appears that a pool sale was made by the syndicate to manufacturers for a three months' supply from January 1 next at a price not transpired, but supposed to be 16½¢. Our market has meanwhile been dull at 17½¢ Lake, nominally, in the open market, and 16¢ @ 16½¢ casting brands. Accounts from Germany are to the effect that the Brass manufacturing branch suffers considerably from the high price of Copper. Perhaps the Brass works of M. Secrétan of the syndicate also interfere at their lower Copper prices with their other Continental competitors, and it is stated Brass goods from that source also begin to be imported here, a gloomy prospect for our manufacturers should the syndicate possess greater longevity than many suppose. The import into Liverpool and Swansea from the United States the first 10½ months has been 21,465 tons fine, against 12,864 tons last year.

Tin.—The statistics are so unfavorable just now that a break has occurred both in London and here. On December 1 the visible supply in Europe and America was 12,478 tons, against only 11,913 on November 1 and 14,053 on December 1, 1887. London gave way in consequence from £100. 17/6, spot Straits, to £99. 10/, and futures from £101. 10/ to £100. Sales, 260 tons. Here 20 tons spot sold from 22.25¢ down to 22¢; 10 tons March

at 22½¢, and 10 January at 22.10¢. *Tin Plates*.—The demand has been moderate only for spot goods, and prices are a shade easier. A good many orders and inquiries have been cabled to the other side, but in most cases business has not resulted, the makers' order books being tolerably well filled for the next three months. We quote at the close, large lines, $\frac{1}{2}$ box: Siemens-Martin Steel, Charcoal Finish, \$4.85 @ \$5.75; ditto, Coke Finish, \$4.70; Terns, \$4.05 @ \$4.25; Bessemer Cokes, \$4.25 @ \$4.35; and Wasters, \$4.15. Liverpool comes 12/3 @ 13/6.

Lead—Has been gradually looking up again, because the available supply for consumptive purposes at this point is momentarily well held and not overabundant. Some 300 tons Common Domestic were taken at 3.70¢ @ 3.75¢, and at the close 3.80¢ @ 3.85¢ is asked, while 3.75¢ is offered. St. Louis is 3.50¢ @ 3.55¢. In London Soft Spanish is steady at £13. 2/6, and English Pig at £13. 5/.

Spelter.—Nothing of special interest has occurred in our own market, which has been dull at 5¢ @ 5½¢ for Common Domestic, and Silesian, nominally, 5¼¢. London gave way with the latter to £17. 17/6. The rumors about a new German-Belgian syndicate amount to nothing. The International Syndicate expires on July 1, 1889, when it may possibly be renewed for five years, but this will only come up for consideration next spring.

Antimony—Has continued strong at 12¼¢ @ 13¢ for Cookson and 10½¢ @ 11¢ for Hallett; the demand is good and the stock light. Hallett remains unaltered, £44, in London.

New York Metal Exchange.

The following sales are reported:

SATURDAY, December 1.	
10 tons Tin, spot	22.25¢
10 tons Tin, March	22.50¢
MONDAY, December 3.	
16 tons Lead, March	3.80¢
TUESDAY, December 4.	
10 tons Tin, January	22.10¢
10 tons Tin, spot	22.00¢

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from November 23 to November 30, inclusive, and from January 1 to November 30, inclusive, were as follows:

Iron and Steel.		Nov. 23 to Nov. 30.	Jan. 1 to Nov. 30.
		Tons.	Tons.
Pig Iron: Crocker Bros.	465	14,222	550
R. F. Downing & Co.	250	14,350	1,105
G. W. Stetson & Co.	200	2,053	301
G. T. Carter	200	11,732	300
Spiegeleisen: C. L. Perkins	301	100	100
Naylor & Co.	300	100	420
N. S. Bartlett	100	15	11,797
Geisenheimer & Co.	100	60	280½
Crocker Bros.	15	58	808
Steel: R. F. Downing & Co.	60	33	1,421
Oelrichs & Co.	58	13	645
W. F. Wagner	33	11	246
R. H. Wolff & Co.	13	7	225½
M. Cohn	11	6	500
C. F. Boker	7	6	568
F. S. Pilditch	6	300	18,807
J. Abbott & Co.	6	223	6,084
Steel Rods: Naylor & Co.	300	101	101
Dana & Co.	223	68	3,800
E. S. Wheeler & Co.	101	31	1,096
R. H. Wolff & Co.	68	14	529
Steel Sheets: Pierson & Co.	31	10	69
Naylor & Co.	14	349	2,515
Williams & Whitney	10	50	90
Steel Blooms: Naylor & Co.	349	251	251
Steel Hoops: Bullard & W.	50	20	83
Steel Wire Rods: J. Abbott & Co.	251	200	315
Cary & Moe	20	125	7,263½
Iron: R. F. Downing & Co.	200	50	250
J. Abbott & Co.	125	152	697
A. Milne & Co.	50	51	117
Iron Rods: Naylor & Co.	152	35	1,374
Wire Rods: R. F. Downing & Co.	51	85	490
Sheet Iron: T. B. Coddington & Co.	35	85	623
Swedish Rough Bars: C. v. Philp	85	32	32
Swedish Bar Iron: C. v. Philp	85	13	774
Swedish Bar Ends: Naylor & Co.	32		
Charcoal Iron: Naylor & Co.	13		

Iron Girders: R. F. Downing & Co.	30	568½
Swedish Wire Rods: C. v. Philp	51	55
Swedish Bessemer Steel Ingots: C. v. Philp	60	60
Oil Barrel Hoops: G. W. Sheldon	200	200

Tin Plates.

	Boxes.	Boxes.
T. B. Coddington & Co.	4,069	162,987
Phelps, Dodge & Co.	1,823	324,486
N. L. Cort & Co.	1,564	109,216
A. A. Thomson & Co.	1,705	143,952
Pratt Mfg. Co.	442	158,891
Bruce & Cook	375	92,823
Merchant & Co.	362	22,912
Jas. Byrne & Son	247	33,601

Metals.

	Pounds.	Pounds.
Tin: Muller, Schall & Co.	448,979	11,718,484
Phelps, Dodge & Co.	112,003	3,749,825
Naylor & Co.	111,919	3,663,403
Spelter: Naylor & Co.	78,234	551,147
	Casks.	Casks.
Antimony: Phelps, Dodge & Co.	50	680

Irons and Metals Warehoused from November 23 to November 30, inclusive:

Swedish Iron: J. Abbott & Co.	Tons.
	101

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs.,	12	
Buchanan & Lyall, Mach'y, cs.,	4	
Field, Alfred & Co., Mdse., cs.,	3	
Folsom Arms Co., Mdse., cs.,	3; Arms, cs.,	4
Fraser, P. A. & Co., Mdse., cs.,	3	
Graef Cutlery Company, Cutlery, cs.,	4	
Schoverling, A., Arms, cs.,	6	
Schoverling, Daly & Gales, Arms, cs.,	23	
Taylor, Thos., Mdse., cs.,	5	
Thebaud Bros., Mach'y, pkgs.,	14	
Wiebusch & Hilger, Lim., Mdse., cs.,	12	
Order: Mach'y, cs.,	2; ditto, pkgs.,	24

Exports of Metals.

	Nov. 23 to Nov. 30.	Jan. 1 to Nov. 30.
	Pounds.	Pounds.
Copper: J. Abbott & Co.	13,132,530	4,041,522
Lewisohn Bros.	2,581,263	6,018,291
F. A. Lomal	223,939	112,000
American Metal Company	112,000	590,000
G. H. Nichols	110,276	430,000
J. Bruce Ismay	224,034	112,036
S. Mendel	1,250	449,881
Ledoux & Co.	125,000	1,451,130
Muller, Schall & Co.	90,320	430,000
Copper Queen Con. M. Company	448,809	112,000
J. Kennedy, Tod & Co.	250,000	6,250
H. Becker & Co.	6,250	189,984
Orford C. & S. Rfg. Company	449,881	229,371
Robt. M. Thompson	1,451,130	4,000
Thos. J. Pope, Sons & Co.	40,320	1,000
Williams & Terhune	724,790	37,852,539
J. Parsons & Co.	3,021,610	4,964,830
Naylor & Co.	149,811	337,447
Bridgeport Copper Company	989,800	184,288
C. Herold	6,250	729,777
Phelps Bros.	189,984	180,995
R. W. Jones	229,371	41,652
Ladenburg, Thalmann & Co.	4,000	
W. H. Crossman & Bro.	1,000	
R. Crooks & Co.		
Copper Matte: Williams & Terhune	176,960	1,252,156
Lewisohn Bros.	14,500	357,500
American Metal Company	661,920	2,248,015

Notwithstanding all that has been said against the great Eiffel Tower, at Paris, the work is being steadily carried forward. On the first of last month it had attained a height of 178 m. (587 feet), and the present rate of progress is at the rate of 36 feet per week. If this be maintained, the whole of the principal parts of this immense structure will be erected by the end of January, 1889. Meanwhile the decorative and accessory parts of the work are not neglected, and there is every prospect that the tower will be completed in all its details at the opening of the exhibition.

Vulcanized fiber for mechanical purposes has for some time attracted attention. As a material for cogs, where the moist from ordinary gearing is inconvenient, it has, according to all accounts, given very satisfactory results. In one case gutta percha cogs are known to have been used for 20 years. When the wheels became worn, the material was utilized for casting fresh ones.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, Dec. 5, 1888.

Copper has been quieter the past week. Consumers have purchased sparingly, and, as a rule, only when supplies might be secured at less than the "syndicate" prices. Speculation has been on a smaller scale, with the buying still confined mainly to the "syndicate" agents. There are again reports of a new company forming to carry out the proposed extended contracts with the several mining companies, but nothing definite regarding the success of the project appears to be known in "outside" quarters.

Negotiations are under way in Paris for the sale of the Anaconda mine's 1889 product by the "syndicate," but at last accounts the sale had not been consummated. The product of the last six months of the current year was placed at 15/ $\frac{1}{2}$ unit.

Accurate data just made public shows that the importations of Matte into England the past 11 months aggregated 26,000 tons.

Block Tin has declined about 15/ owing to free offerings for distant future delivery, especially by importers, and a more or less general belief that that fact indicates fuller supplies later on. The available stock here is low, however, and in few hands.

Pig Iron warrants have undergone a further advance, and the market for these and for Makers' Iron continues to harden. The upward tendency of prices, however, is due to the banking down of furnaces, consequent upon scarcity of fuel, and not to increased demand. Purchases for consumption and export are of somewhat restricted volume, as is not unusual toward Christmas time. The demand for Hematites has shown considerable spirit and liberal purchases have been made for consumption at 1/ @ 2/ advance. Most brands of Scotch Pig are 6d to 1/ higher, and 3d advance has been paid for Middlesboro'.

A good trade is doing in nearly all descriptions of Steel, and makers, as a rule, have sufficient orders to keep their works actively employed over the turn of the year. In Siemens-Martin Plates and Angles the activity has been remarkably prominent during the past 30 days. The large capacity of the Steel mills in operation serves, however, to check any considerable advance in prices. There have been numerous inquiries the past week on Steel Blooms and Billets for the American market. The West Cumberland Iron and Steel Company has suspended, labor disputes having seriously interfered with the carrying out of contracts.

The Tin-Plate trade has been very quiet. Buyers operate cautiously and with a view to purchasing at lower prices. On the other hand, the majority of makers who have closely sold their output are indifferent to current offers in view of the firmness of prices for Plate Bars and probabilities of an advance on the same.

Cleveland Pig.—Transactions have been larger, and prices are a fraction higher. No. 1 Middlesboro', G.M.B., 36/6; No. 3 do., 34/.

Scotch Pig.—The market has shown a fair degree of spirit, and prices are higher on nearly all brands.

No. 1 Coltness, f.o.b. Glasgow	50/
No. 1 Summerlee, " "	50/
No. 1 Gartsherrie, " "	48/6
No. 1 Langloan, " "	49/6
No. 1 Carnbroe, " "	43/6
No. 1 Shotts, " at Leith	49/
No. 1 Glengarnock, " Ardrossan	47/6
No. 1 Dalmeilington, " "	43/6
No. 1 Eglinton, " "	42/3
Steamer freights, Glasgow to New York, 3/6,	
Liverpool to New York, 10/.	

Bessemer Pig.—There has been a large business and prices have advanced about 2/ during the week. West Coast brands, mixed numbers, 44/6, f.o.b. shipping point.

Spiegeleisen.—The output is closely absorbed and prices remain very firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—Business in this branch continues brisk, but prices are no higher. Standard English sections quoted at £3. 18/9, and light sections £4 @ £4. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—There is a fair demand, but new business moderate. We quote £3. 18/9 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—For these the demand is still fairly active and prices firm. Bessemer, 2½ x 2½ inch, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—There has been more doing, but at somewhat modified prices. Bessemer, £3. 18/9, f.o.b. at N. W. England shipping point.

Old Rails.—Demand runs fair, and prices are quite firm. Tees quoted at £3. 6/ @ £3. 7/6, and Double Heads, £3. 7/6 @ £3. 10, c.i.f. New York.

Scrap Iron.—A fair business reported at steady prices. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—The market steady, with fair demand. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—Buyers operate cautiously, but sales have been larger than during the preceding week. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/6
IC Bessemer steel, Coke finish	13/6 @ 13/9
IC Siemens	13/9 @ 14/
IC Coke, B. V. grade	13/3 @ 13/6
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—Business in most departments is still of good volume and prices remain firm. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
Common	@ 5 10 0
Staff. Bl'k Sheet, singles	@ 7 10 0
Welsh Bars (f.o.b. Wales)	5 0 0 @ 5 2 6

Tin.—The market weak under freer offerings for future delivery. Straits quoted at £99. 10/ @ £100, spot, and £100 @ £100. 10/ for three months' futures.

Copper.—Dealings have been moderate at slightly lower prices. Chili Bars, £77. 10/, spot, and £78 @ £78 2/6, three months' futures. Best Selected, £80. 10/.

Lead.—The demand has been slow and the market rather weak. Soft Spanish, £13 @ £13. 2/6.

Spelter.—Transactions have been larger and the market is stronger. Silesian, ordinary, £18. 10/ @ £18. 12/6.

The H. C. Frick Coke Company, of Pittsburgh, recently shipped 900 tons of coke to New Brunswick, N. S. It went over the Baltimore and Ohio Railroad to Locust Point and thence by ocean steamer.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	10.3
Florin (Netherlands)	10.2
Florin (Austria)	35.3
Milreis (Portugal)	81.08
Milreis (Brazil)	54.6
Mark (Germany)	33.8
	Pounds.
Kilogram	2.205
Picul	134.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, October 26, 1888.—**Asphaltum.**—There has been a steady demand at firm figures. Boiled bringing \$14.04 p ton, f.o.b., and Crude \$6.84. The export since January 1 sums up 44,207 tons, against 36,000 last year and 34,241 in 1886. *Exchange*, 90 days' sight, \$4.80 @ \$4.85.—*E. P. Masson.*

EAST INDIES.

SINGAPORE, October 16, 1888.—**Tin.**—Has been active at \$37.75 @ \$38.25, with sales of 610 tons since the 1st inst., closing firm at \$38 p picul. The export from January 1 to the 10th inst has been: To England, 130,221 piculs, against 62,085 in 1887 and 42,587 in 1886; to the Continent, 14,971, against 20,647 and 21,219, and to the United States 36,366, against 52,322 and 28,496. *Gum Damar.*—A few lots Malacca have been taken at \$4.90 p picul. *Gum Copal.*—A sale of 100 tons was made at \$6.50 @ \$8.50 p picul. *Gutta Percha.*—Fine quality is wanted and rising; prime may be quoted \$95 p \$115, and seconds \$55 @ \$85. *Exchange*, Four months' bank, 31½.—*Gilfillan, Wood & Co.*

PENANG, October 16, 1888.—**Tin.**—Receipts for the fortnight aggregate 9000 piculs; sales to Europeans, 420; to Chinese, 7000. The market opened at \$38.18 p picul, rose to \$38.45 and declined to \$37.75, winding up at \$37.90. China pays considerably above London parity. The export from January 1 to the 14th inst. was 110,076 piculs to England, 338 to the Continent, and 7316 to the United States. *Gum Benjamin.*—No. 1 has been selling at \$34 @ \$69, No. 2 \$20 @ \$50. *Gutta Percha.*—Prime may be quoted \$90 @ \$100. *India Rubber.*—\$70 @ \$75 p picul, as to quality, has been paid. *Exchange.*—Four months' bank bills 31½.—*Schmidt, Kustermann & Co.*

COLOMBO, CEYLON, October 18, 1888.—**Plumbago.**—Has been selling to a moderate extent as follows, in rupees, p ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust 40 @ 65. Following are the shipments made since the 1st inst.: To England, 16,098 cwt.; to Hamburg, 851, and to the United States 2380—together, 19,329, against 4508 in 1887, 22,457 in 1886, and 17,555 in 1885. *Exchange.*—Six months' sight, 1/4 15-16.—*Volkart Brothers, through their agent, John W. Greene, 82 Wall street, New York.*

MANILA, November 26, 1888.—**Hemp** has been dull at nominally \$11.50 p picul, against \$9.50 same date last year, equaling p ton, cost and freight, \$37. 17/6, against \$33. 12/. The clearances for the United States since last cable amount to 11,000 bales, against 7000 in 1887; since January 1st, 222,000, against 238,000; loading for the United States, 25,000, against 14,000; cleared for England since January 1, 312,000 bales, against 210,000; loading for do., 15,000, against none; cleared for all other ports, 65,000 bales, against 41,000; receipts at all ports since last cable, 16,000, against 19,000; since January 1, 600,000 bales, against 496,000 in 1887 and 365,000 in 1886. *Freight*, \$7, against \$5.50. *Exchange*, six months' sight, 3/7½, against 3/8.—*Ker & Co., per cable to Mr. Charles Nordhaus, East India agent, 89 Water street, New York.*

JAPAN.

YOKOHAMA, October 14, 1888.—**Coal.**—Japan produces at present 1,000,000 tons, and exported last year 704,935 tons, worth \$2,337,804. The Takashima mines turn out the best Coal, and produced in 1887 370,000 tons; the Muki mines, 240,000 tons; the Poronai mines, 80,000, and the remaining ones, 310,000.—*Japan Mail.*

TURKEY.

CONSTANTINOPLE, November 18, 1888.—**Mining.**—A Government decree is published in the official *Gazette* sanctioning a concession made the Société Minière de l'Empire Ottoman, or to the company's representative, Signor Leonidas Baltazzi, of working 14 mines situate in different localities in Turkey.—*Pera Gazette.*

PORTUGAL.

LISBON, November 22, 1888.—**Copper.**—The Barancannes Copper mines are situated four miles from Almodovar and 20 miles from the Carregueiro station on the direct railroad line to this city. A company has just been formed at London for the working of these mines with a capital of £120,000 in £1 shares, the Barancannes Copper Mining Company, Limited.

The concessions cover an area of 246 acres.—*O. Commercio.*

SPAIN.

BILBAO, November 17, 1888.—**Iron Ore.**—The Campanil mines are owned by five proprietors, and these, in view of the perceptible gradual exhaustion of these mines, have held a meeting and agreed to reduce the output for next year to one-half, and fix the price at 8/3 @ 8/6; at the same time 8/6 was offered for a superior lot, but declined, the owner not feeling disposed to part with the same for less than 9/ p ton. Some business was done in single cargoes Rubios at 6/10 @ 7/3. Total shipment to date 3,222,181 tons, against 3,789,123 in 1887.—*Bilbao Marítimo y Comercial.*

GERMANY.

HAMBURG, November 24, 1888.—**Iron.**—Pig Iron has been moderately active, and the only change occurring has been the raising of Forge Pig 1 mark p ton. Spiegel has been steady at 53 marks p ton for 10 to 12 %. Merchant has been the reverse of brisk in Rhenish-Westphalia, both the home and export demand being slack. The entire Wire branch is flat. The quotations are, p ton, Merchant, 125 @ 127.50; Beams, 135; Hoop Iron, 125; Boiler Plates, 150; Tank do., 150; Siegen Thin Sheets, 148 @ 150; Steel Sheets, 150, and Steel Rails, 117.50 @ 120. Exportation of Iron and Steel from Upper Silesia to Russia has been resumed on a very large scale, especially since the financial improvement in that country. Hence, there is not a single branch in Silesia in the line which does not flourish at present, the Wire branch included. *Metals.*—The rumors about a new Spelter syndicate of Belgian and German makers are without foundation. The international Spelter syndicate will expire on July 1 next year, and in spring efforts will be made to renew it for five years. It merely restricts production, and does not control prices. Brass manufacturers complain that they cannot obtain prices sufficiently high for their goods to correspond to the high price they have to pay for Copper, there being no margin left to speak of. Consumers of Tin make similar assertions. At 210 marks for Tin, they say they cannot make any money.—*Borsenhalle.*

The Wear of Rails.

The comparative wearing qualities of iron and steel rails formed a very fruitful topic of discussion at one time in railroad circles, but the question suddenly lost its vitality when the price of steel rails fell below the cost of production of iron rails. It is, therefore, a matter of much less interest than would have been the case, say ten years since, to note the experience in this respect of the Wabash Railway, which has just been made public. The company removed from its tracks this fall some iron rails which had been first laid down in 1856, and about the same time they took up some English steel rails which were first used in 1873. The iron rails, after a life of 32 years, were sold to be remanufactured, and the steel rails, which had been in use for 15 years, were relaid on a branch road, where they are expected to last for 12 to 15 years more. The "expectation of life" in either case would therefore seem to be nearly the same, with the difference in favor of the iron rails, probably due to the fact that the latter began their career in an era of less traffic, slower trains, lighter locomotives and smaller freight cars. Nevertheless, the facts cited go far to sustain the position of the erstwhile advocates of the continued use of iron rails, that well-made iron rails would sustain the wear and tear of regular railroad traffic as well as steel rails. It is worthy of note, in this connection, that the Wabash steel rails cost \$103 per ton, in gold, in 1873, and that the old iron rails were sold this fall for more than three-fourths the price of new steel rails, ton for ton.

Western merchants and commercial travelers are agitating the adoption by all lines of railroad of a 5000-mile interchangeable ticket. It is urged that if a few lines can arrange to use such a ticket, as they have done, it would be perfectly feasible to make it general.

Hardware.

There is only a moderate amount of trade, orders for the most part being limited to small lots required for completing assortments, and comprising a good many seasonable goods. Prices remain remarkably steady, the narrow margin of profit not permitting further reductions. Business throughout the country is generally reported as quite satisfactory, and anticipations of a good winter's trade are entertained.

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The change in the price of Shot, to which we referred in a recent issue as likely to occur, was made by the manufacturers December 1, a further reduction of 7 cents per pound being announced. Prices are as follows, subject to a discount of 2 cents per bag of 25 pounds for cash within five days:

Drop, per 25-pound bag.....	\$1.16
Drop, per 5-pound bag.....	.29
Buck and Chilled, per 25-pound bag.....	1.41
Buck and Chilled, per 5-pound bag.....	.34
Dust, per 25-pound bag.....	1.75
Dust, per 5-pound bag.....	.40

It is considered, at these revised prices, that Shot about corresponds with the price of Lead, and the present condition does not appear to give any reason for a further decline. It will also be observed that the above prices for Shot are exceptionally low, and it is thought probable that somewhat advanced prices will be named within a few months.

The market for Steel Squares shows but little change, except that somewhat lower quotations are named by some of the manufacturers.

For some time Fence Staples, Galvanized and Plain, have been regularly sold at the same price as Barbed Wire, but recently manufacturers have shown a disposition to make slight concessions on the Staples when sold in good lots.

The jobbers are giving attention to the Wire Cloth market, and beginning to place their orders for the coming season. The figures which are quoted by the manufacturers on this line of goods are regarded as slightly lower than those that prevailed a year ago, indicating that purchasers will obtain slight concessions during the coming season. It will, however, be the part of wisdom for the trade not to force prices below a profitable level, as in this line of goods there is a liability that the quality will suffer if the prices are unremunerative.

The market for Lead Pencils is in an unsettled condition, and prices, owing to the termination of an understanding between the manufacturers, are considerably lower than heretofore.

Stuart & McLean, Iron and Steel factors, Hamilton Building, Pittsburgh, Pa., issue from time to time quotations on varied lines of goods which they are prepared to supply to the trade. They intimate that they are now in a position to furnish Square Nuts at terms which are deserving of attention.

The following is our report of the Louisville market, dated December 3:

The Hardware trade of Louisville, Ky., during the past week has been a little improvement over the previous one. Some jobbing houses report business as slow, but then we are to expect a hold-up now for a while. Others,

again, are very busy, especially those handling heavy goods.

Cut Nails have in a measure recovered, a good feeling prevailing, and the trade which has lent a willing hand to the mills must be protected by them. A general stiffening up individually seems to be going on, without concert of action, and if this is kept up it will be more satisfactory to the trade than the nominal association advances. Wire Nails are in good demand, and are held firm by the mills.

Barb Wire has made the greatest cut ever known to the trade, and has reached a point never before dreamed of, and the worst of it is some manufacturers have given prices to the small trade, buying not more than one car, same as to jobbers who take five to ten carloads. There is no telling where prices will go to. Through the upper cotton belt territory reached by Louisville nearly one-half the cotton crop, which is a large one, is still unpicked in the fields. This is apt to lead to tardy remittances, and is caused by two factors, the long and heavy rains and the demoralization of the negro labor by the result of the election, they not realizing that they will have to work just as hard for a living as last year, and the cotton crop is dependent entirely on them for artisans.

We have received the following details concerning the new Hardware jobbing house to be started at Omaha, Neb. It will be conducted by the

Omaha Hardware Company.

a corporation organized under the laws of Nebraska, for which articles were filed with the county clerk of Douglas County on the 15th of November. The authorized capital is \$500,000, divided into shares of \$100 each. Stock to the amount of \$200,000 was issued, which will be fully paid up. The indebtedness will be limited to 60 per cent. of the amount of stock issued. The affairs of the business will be governed by a board of seven directors. The officers of the company are as follows: T. H. Taylor, general manager; P. C. Himebaugh, president; I. A. Miller, vice-president; W. H. Hulshizer, secretary; A. S. Carter, treasurer. They have leased the new Ames building, situated at the corner of Ninth and Jones streets, Omaha. This building is 44 feet front by 132 feet deep, containing six floors, which will give the company ample room for the present. It is in the heart of the city, yet is located on the railroad tracks, and thus possesses unusually good facilities for the prompt and speedy transaction of business. The company have already secured the services of a corps of old and experienced traveling salesmen, who are thoroughly acquainted with the territory and trade tributary to Omaha. The active officers of the company are young men of recognized ability and long experience, and have an extensive acquaintance throughout the East and West that will prove valuable to the concern. They are backed by men whose names are a guarantee of the stability of the new undertaking, and they will have ample capital with which to conduct a successful business. The present condition of the Hardware market is regarded as very favorable for the purchase of a new jobbing stock, because prices on many staple articles are now ranging lower than has ever before been known in the Hardware line. At the same time the prospect for business in the coming year in that section of the West is remarkably bright, so that altogether the new house will start out under most encouraging auspices and with very bright anticipations of a prosperous career.

Items.

Kellogg, Johnson & Bli.s, 108 and 110 Randolph street, Chicago, have issued an illustrated price list of Woodworkers' Tools. It is a handsome volume of 154 pages, bound in stiff paper covers, and presents a bewildering variety of illustrations of Tools used by carpenters, cabinet-makers, carvers, bridge builders, ship carpenters, lumbermen, &c. Large as the list of contents is, the firm say that it falls

far short of what they carry in stock, as they make a specialty of Tools. Full directions how to order are printed in the preface. An excellent feature of the book is an alphabetical index giving the names of all the Tools mentioned and the pages on which they are to be found described. The last 15 pages are devoted to a full list of special net cash prices, in which the several sizes of each article are quoted separately. The book is an extremely valuable publication for mechanics, who will find in it many Tools not frequently brought to their notice, but whose value to them will at once be recognized. The firm have printed a limited edition of the work, and therefore prefer to confine its distribution to the Northwest, including Michigan and Indiana, that portion of the country being their natural territory.

The Sanford Fork and Tool Company, Terre Haute, Ind., of which Robert Nixon is president, H. A. Urban secretary and H. S. Deming treasurer, have issued a new catalogue of their line of Forks, Rakes, Hoes, &c. It is a handsomely printed pamphlet in two colors on excellent paper and shows effectively their well-known line of goods.

Gaston, Weston & Ladd, Torrington, Conn., issue circulars relating to Prestoline, a liquid metal burnisher, for use on brass, bronze, copper, steel, zinc, tin, nickel, German silver, &c. Another circular is devoted to Gaston's Silver Compound for silver plating, cleaning and polishing. This is described as a preparation of pure silver and chemicals, and is warranted to contain 12 grains of sterling silver per fluid ounce of solution.

Lufkin Rule Company, Cleveland, Ohio, issue a striking sheet in which their Rules, Perfection Glass Board and other manufactures are illustrated, and also a separate circular devoted to the Glass Board, for which a number of testimonials are given.

Rector & Wilhemy Company, Omaha, Neb., issue a circular of IXL Ventilator, manufactured by M. F. Koenig & Co., explaining its construction and giving testimonials in regard to it.

William T. Valentine & Son, Albany, N. Y., issue a circular entitled "What is Felt Weather Strip?" in which they give a description of their manufactures, enumerating the advantages possessed by them. Their illustrated catalogue shows the different patterns in which they are putting the goods on the market.

William C. Vajen, who is well known to the Hardware trade, has branched out into a new line of business, having opened an office at 79 East Market street, Indianapolis, Ind. Real estate, loans and insurance will here receive his attention.

Bennett & Shirk, manufacturers' agents for a variety of specialties handled by the Hardware trade, have removed from 154 Lake street to 112 and 114 Lake street, Chicago. Their removal was caused by their desire to secure sufficient room to carry a stock of the goods which they sell. In their new location they secure ample facilities to make this change in their system of transacting business. By shipping from stock in Chicago they will be enabled to meet the demands of a large class of merchants who desire to be served more promptly than if they were obliged to await shipments from factory.

The John Pritzlaff Hardware Company, Milwaukee, Wis., have issued their No. 3 price current under date November 27. It illustrates Skates and Sleigh Bells, including Saddle and Shaft Chime Bells. Illustrations, list prices and discounts are given.

Stanley's "Odd-Jobs," a very unique tool, first manufactured by the Stanley

Rule and Level Company in June last, has already proven its right to be. The manufacturers report sales of 6000 of these tools at this date, and that without diminishing the demand for their other tools, of which this single one embraces 10 or 12 different kinds. The artistic form given to the tool, and its nickel-plate finish, commend it as a holiday present for mechanics or amateurs.

The Gooch Freezer Company, Cincinnati, Ohio, issue a circular calling attention to the Peerless and Giant Ice-Cream Freezers, in which their special features are explained and some of the advantages claimed for them enumerated.

Peavey Brothers, of Sioux City, Iowa, are about to retire from the jobbing trade, and their traveling salesmen are now seeking other connections for next year. It is understood that the members of the firm have invested in a street railway, and propose to devote their time and energy to operating it.

The Peters Cartridge Company, Cincinnati, Ohio, issue a circular relating to their Crimped Cartridges, concerning the loading of which they give information. It is stated that until their new catalogue is issued the Crimped Cartridges may be ordered by the same old numbers as the Indented if it is stated which are desired, Crimped or Indented. The prices and discounts are the same in either case.

Hamblin & Russell Mfg. Company, Worcester, Mass., advise us that they carry a stock of Wire Goods and Hardware Specialties at 20 Cliff street, New York, where they are represented by J. A. Boughan.

Clark, Quien & Morse, Peoria, Ill., have issued a 60-page pamphlet, well arranged and neatly printed, relating to Metals, Stamped Ware, Tinners' Trimmings, Japanned Ware, &c., and showing an interesting and well-assorted line of these goods, all of which, we are advised, are carried in stock.

Hamblin & Russell Mfg. Company, Worcester, Mass., have adopted the method of representing their goods in miniature on the back of their letter paper, thus in a small space giving illustrations and bills of a large variety of Hardware specialties.

Joseph Churchyard's Sons, Buffalo, N. Y., are about issuing an attractively printed catalogue relating to their Refrigerators, Ice Chests and Bellows. The address to the trade refers to the characteristics of, and claims for, their line of Refrigerators, which is referred to as having been very favorably regarded by the trade during the past season, when they were first put on the market. They have added a number of new designs to their line, which are appropriately illustrated.

The St. Joseph Iron Company, St. Joseph, Mo., issue a convenient sheet of prices representing their line of Iron and Steel, Heavy Hardware, Wagon and Carriage Hardware, &c. The different lines are classified and net prices given.

The Ross & Fuller Association, 33 Chambers street, New York, have been appointed general salesmen by the Elizabethport Cordage Company, Elizabethport, N. J., for the sale of their products, such as Manila and Sisal Rope, Binders' Twine, &c. A full line of samples can be seen at their sample-room. All orders will be filled at factory prices.

The following from the Australasian *Ironmonger* refers to the position in the Colonial markets of American Cutlery:

The efforts made by American manufacturers of Cutlery to open a market here have been few and far between, and sufficient energy has not been shown in pushing a trade. Finding the competition very great in this class of

goods, and not by any means an easy job to have it all their own way, they have neglected this for other markets where a larger business can be done and better profits realized. The failure here is because the prices are a shade higher and the effort required to alter the current of an established trade has not been properly made. The only firm I have heard of as well known here is the Henry Seymour Cutlery Company, New York City, manufacturers of Tailor Shears, Shears and Scissors, although other firms are no doubt heard of through indentors. The John Russell Cutlery Company is one of these. An exception to the above is to be found in Butchers' Knives, which are highly appreciated and have a good sale.

Nathaniel Jacobi, Wilmington, Del., announces that he has taken his son Marcus W. Jacobi into partnership, and that hereafter the business will be conducted under the name and style of the N. Jacobi Hardware Company.

The Gibbs Lawn Rake Company, Canton, Ohio, have appointed John H. Graham & Co., 113 Chambers street, New York, their general agents for the United States, from whom their goods may be had at all times at factory prices. The company are manufacturers of the Gibbs and Canton Lawn Rakes and Gibbs and Imperial Post-Hole Diggers, Grub Hoes and Lawn-Hose Holders. This agency went into effect November 24, and the company announce that all quotations prior to that date not under contract are withdrawn.

Paine, Diehl & Co., Philadelphia, have secured the control of the Keystone Beater, which is so favorably known to the trade. They are making arrangements, we understand, for its manufacture on an enlarged scale and for the effective marketing of it in all parts of the country. Orders and inquiries from the trade should, therefore, be addressed to them.

Alfred Field & Co., 93 Chambers street, New York, are calling attention in their announcement on page 66 to their Improved Double Action Acme Skates, No. 5. The point which they emphasize is that the lever works both right and left, so that each Skate can be used for either foot, and all parts are screwed, not riveted.

The Proposed Hardware Syndicate in England.

The movement for the organization of an association of ironmongers in England for the consolidation of their purchases, to which we referred in our last issue, is evidently regarded there with much interest, and a number of letters on the subject appear in the English journals. From the tenor of many of these it is evident that trade there is interfered with to a large extent by the competition of co-operative stores, the handling of Hardware by houses engaged in other lines of business, and the selling by the manufacturers direct to the consumers. At the same time there would appear to be on the part of the Hardware trade in that country a lack of enterprise and push, which, from the American standpoint, are regarded as essential to the successful prosecution of any business. There are also indications that the trade are in the habit of purchasing on time instead of for cash, and without that promptness in payment which is so important a factor in profitable buying. On this point a retired manufacturer publishes the following letter in the London *Ironmonger*, and it will be observed that the considerations to which he refers are equally applicable to trade on either side of the ocean:

There are certain classes of tradesmen—ironmongers in particular—who "wonder how it is they cannot sell as cheaply as, and compete with, others selling the same class of goods as themselves." The solution of the problem is easy and simple. The "Co-operative Stores," "Supply Associations," and "Give Away" tea shops are their greatest enemies, and these they have to compete with. How are they to

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Drop, per 25-pound bag	\$1.16
Drop, per 5-pound bag	.29
Buck and Chilled, per 25-pound bag	1.41
Buck and Chilled, per 5-pound bag	.34
Dust, per 25-pound bag	1.75
Dust, per 5-pound bag	.40

It is considered, at these revised prices, that Shot about corresponds with the price of Lead, and the present condition does not appear to give any reason for a further decline. It will also be observed that the above prices for Shot are exceptionally low, and it is thought probable that somewhat advanced prices will be named within a few months.

The market for Steel Squares shows but little change, except that somewhat lower quotations are named by some of the manufacturers.

For some time Fence Staples, Galvanized and Plain, have been regularly sold at the same price as Barbed Wire, but recently manufacturers have shown a disposition to make slight concessions on the Staples when sold in good lots.

The jobbers are giving attention to the Wire Cloth market, and beginning to place their orders for the coming season. The figures which are quoted by the manufacturers on this line of goods are regarded as slightly lower than those that prevailed a year ago, indicating that purchasers will obtain slight concessions during the coming season. It will, however, be the part of wisdom for the trade not to force prices below a profitable level, as in this line of goods there is a liability that the quality will suffer if the prices are unremunerative.

The market for Lead Pencils is in an unsettled condition, and prices, owing to the termination of an understanding between the manufacturers, are considerably lower than heretofore.

Stuart & McLean, Iron and Steel factors, Hamilton Building, Pittsburgh, Pa., issue from time to time quotations on varied lines of goods which they are prepared to supply to the trade. They intimate that they are now in a position to furnish Square Nuts at terms which are deserving of attention.

The following is our report of the Louisville market, dated December 3:

The Hardware trade of Louisville, Ky., during the past week has been a little improvement over the previous one. Some jobbing houses report business as slow, but then we are to expect a hold-up now for a while. Others,

again, are very busy, especially those handling heavy goods.

Cut Nails have in a measure recovered, a good feeling prevailing, and the trade which has lent a willing hand to the mills must be protected by them. A general stiffening up individually seems to be going on, without concert of action, and if this is kept up it will be more satisfactory to the trade than the nominal association advances. Wire Nails are in good demand, and are held firm by the mills.

Barb Wire has made the greatest cut ever known to the trade, and has reached a point never before dreamed of, and the worst of it is some manufacturers have given prices to the small trade, buying not more than one car, same as to jobbers who take five to ten carloads. There is no telling where prices will go to. Through the upper cotton belt territory reached by Louisville nearly one-half the cotton crop, which is a large one, is still unpicked in the fields. This is apt to lead to tardy remittances, and is caused by two factors, the long and heavy rains and the demoralization of the negro labor by the result of the election, they not realizing that they will have to work just as hard for a living as last year, and the cotton crop is dependent entirely on them for artisans.

We have received the following details concerning the new Hardware jobbing house to be started at Omaha, Neb. It will be conducted by the

Omaha Hardware Company.

a corporation organized under the laws of Nebraska, for which articles were filed with the county clerk of Douglas County on the 15th of November. The authorized capital is \$500,000, divided into shares of \$100 each. Stock to the amount of \$200,000 was issued, which will be fully paid up. The indebtedness will be limited to 60 per cent. of the amount of stock issued. The affairs of the business will be governed by a board of seven directors. The officers of the company are as follows: T. H. Taylor, general manager; P. C. Himebaugh, president; I. A. Miller, vice-president; W. H. Hulshizer, secretary; A. S. Carter, treasurer. They have leased the new Ames building, situated at the corner of Ninth and Jones streets, Omaha. This building is 44 feet front by 132 feet deep, containing six floors, which will give the company ample room for the present. It is in the heart of the city, yet is located on the railroad tracks, and thus possesses unusually good facilities for the prompt and speedy transaction of business. The company have already secured the services of a corps of old and experienced traveling salesmen, who are thoroughly acquainted with the territory and trade tributary to Omaha. The active officers of the company are young men of recognized ability and long experience, and have an extensive acquaintance throughout the East and West that will prove valuable to the concern. They are backed by men whose names are a guarantee of the stability of the new undertaking, and they will have ample capital with which to conduct a successful business. The present condition of the Hardware market is regarded as very favorable for the purchase of a new jobbing stock, because prices on many staple articles are now ranging lower than has ever before been known in the Hardware line. At the same time the prospect for business in the coming year in that section of the West is remarkably bright, so that altogether the new house will start out under most encouraging auspices and with very bright anticipations of a prosperous career.

Items.

Kellogg, Johnson & Bli's, 108 and 110 Randolph street, Chicago, have issued an illustrated price list of Woodworkers' Tools. It is a handsome volume of 154 pages, bound in stiff paper covers, and presents a bewildering variety of illustrations of Tools used by carpenters, cabinet-makers, carvers, bridge builders, ship carpenters, lumbermen, &c. Large as the list of contents is, the firm say that it falls

far short of what they carry in stock, as they make a specialty of Tools. Full directions how to order are printed in the preface. An excellent feature of the book is an alphabetical index giving the names of all the Tools mentioned and the pages on which they are to be found described. The last 15 pages are devoted to a full list of special net cash prices, in which the several sizes of each article are quoted separately. The book is an extremely valuable publication for mechanics, who will find in it many Tools not frequently brought to their notice, but whose value to them will at once be recognized. The firm have printed a limited edition of the work, and therefore prefer to confine its distribution to the Northwest, including Michigan and Indiana, that portion of the country being their natural territory.

The Sanford Fork and Tool Company, Terre Haute, Ind., of which Robert Nixon is president, H. A. Urban secretary and H. S. Deming treasurer, have issued a new catalogue of their line of Forks, Rakes, Hoes, &c. It is a handsomely printed pamphlet in two colors on excellent paper and shows effectively their well-known line of goods.

Gaston, Weston & Ladd, Torrington, Conn., issue circulars relating to Prestoline, a liquid metal burnisher, for use on brass, bronze, copper, steel, zinc, tin, nickel, German silver, &c. Another circular is devoted to Gaston's Silver Compound for silver plating, cleaning and polishing. This is described as a preparation of pure silver and chemicals, and is warranted to contain 12 grains of sterling silver per fluid ounce of solution.

Lufkin Rule Company, Cleveland, Ohio, issue a striking sheet in which their Rules, Perfection Glass Board and other manufactures are illustrated, and also a separate circular devoted to the Glass Board, for which a number of testimonials are given.

Rector & Wilhemy Company, Omaha, Neb., issue a circular of IXL Ventilator, manufactured by M. F. Koenig & Co., explaining its construction and giving testimonials in regard to it.

William T. Valentine & Son, Albany, N. Y., issue a circular entitled "What is Felt Weather Strip?" in which they give a description of their manufactures, enumerating the advantages possessed by them. Their illustrated catalogue shows the different patterns in which they are putting the goods on the market.

William C. Vajen, who is well known to the Hardware trade, has branched out into a new line of business, having opened an office at 79 East Market street, Indianapolis, Ind. Real estate, loans and insurance will here receive his attention.

Bennett & Shirk, manufacturers' agents for a variety of specialties handled by the Hardware trade, have removed from 154 Lake street to 112 and 114 Lake street, Chicago. Their removal was caused by their desire to secure sufficient room to carry a stock of the goods which they sell. In their new location they secure ample facilities to make this change in their system of transacting business. By shipping from stock in Chicago they will be enabled to meet the demands of a large class of merchants who desire to be served more promptly than if they were obliged to await shipments from factory.

The John Pritzlaff Hardware Company, Milwaukee, Wis., have issued their No. 3 price current under date November 27. It illustrates Skates and Sleigh Bells, including Saddle and Shaft Chime Bells. Illustrations, list prices and discounts are given.

Stanley's "Odd-Jobs," a very unique tool, first manufactured by the Stanley

Rule and Level Company in June last, has already proven its right to be. The manufacturers report sales of 6000 of these tools at this date, and that without diminishing the demand for their other tools, of which this single one embraces 10 or 12 different kinds. The artistic form given to the tool, and its nickel-plate finish, commend it as a holiday present for mechanics or amateurs.

The Gooch Freezer Company, Cincinnati, Ohio, issue a circular calling attention to the Peerless and Giant Ice-Cream Freezers, in which their special features are explained and some of the advantages claimed for them enumerated.

Peavey Brothers, of Sioux City, Iowa, are about to retire from the jobbing trade, and their traveling salesmen are now seeking other connections for next year. It is understood that the members of the firm have invested in a street railway, and propose to devote their time and energy to operating it.

The Peters Cartridge Company, Cincinnati, Ohio, issue a circular relating to their Crimped Cartridges, concerning the loading of which they give information. It is stated that until their new catalogue is issued the Crimped Cartridges may be ordered by the same old numbers as the Indented if it is stated which are desired, Crimped or Indented. The prices and discounts are the same in either case.

Hamblin & Russell Mfg. Company, Worcester, Mass., advise us that they carry a stock of Wire Goods and Hardware Specialties at 20 Cliff street, New York, where they are represented by J. A. Boughan.

Clark, Quien & Morse, Peoria, Ill., have issued a 60-page pamphlet, well arranged and neatly printed, relating to Metals, Stamped Ware, Tinners' Trimmings, Japanned Ware, &c., and showing an interesting and well-assorted line of these goods, all of which, we are advised, are carried in stock.

Hamblin & Russell Mfg. Company, Worcester, Mass., have adopted the method of representing their goods in miniature on the back of their letter paper, thus in a small space giving illustrations and bills of a large variety of Hardware specialties.

Joseph Churchyard's Sons, Buffalo, N. Y., are about issuing an attractively printed catalogue relating to their Refrigerators, Ice Chests and Bellows. The address to the trade refers to the characteristics of, and claims for, their line of Refrigerators, which is referred to as having been very favorably regarded by the trade during the past season, when they were first put on the market. They have added a number of new designs to their line, which are appropriately illustrated.

The St. Joseph Iron Company, St. Joseph, Mo., issue a convenient sheet of prices representing their line of Iron and Steel, Heavy Hardware, Wagon and Carriage Hardware, &c. The different lines are classified and net prices given.

The Ross & Fuller Association, 33 Chambers street, New York, have been appointed general salesmen by the Elizabethport Cordage Company, Elizabethport, N. J., for the sale of their products, such as Manila and Sisal Rope, Binders' Twine, &c. A full line of samples can be seen at their sample-room. All orders will be filled at factory prices.

The following from the Australasian *Ironmonger* refers to the position in the Colonial markets of American Cutlery:

The efforts made by American manufacturers of Cutlery to open a market here have been few and far between, and sufficient energy has not been shown in pushing a trade. Finding the competition very great in this class of

goods, and not by any means an easy job to have it all their own way, they have neglected this for other markets where a larger business can be done and better profits realized. The failure here is because the prices are a shade higher and the effort required to alter the current of an established trade has not been properly made. The only firm I have heard of as well known here is the Henry Seymour Cutlery Company, New York City, manufacturers of Tailor Shears, Shears and Scissors, although other firms are no doubt heard of through indentors. The John Russell Cutlery Company is one of these. An exception to the above is to be found in Butchers' Knives, which are highly appreciated and have a good sale.

Nathaniel Jacobi, Wilmington, Del., announces that he has taken his son Marcus W. Jacobi into partnership, and that hereafter the business will be conducted under the name and style of the N. Jacobi Hardware Company.

The Gibbs Lawn Rake Company, Canton, Ohio, have appointed John H. Graham & Co., 113 Chambers street, New York, their general agents for the United States, from whom their goods may be had at all times at factory prices. The company are manufacturers of the Gibbs and Canton Lawn Rakes and Gibbs and Imperial Post-Hole Diggers, Grub Hoes and Lawn-Hose Holders. This agency went into effect November 24, and the company announce that all quotations prior to that date not under contract are withdrawn.

Paine, Diehl & Co., Philadelphia, have secured the control of the Keystone Beater, which is so favorably known to the trade. They are making arrangements, we understand, for its manufacture on an enlarged scale and for the effective marketing of it in all parts of the country. Orders and inquiries from the trade should, therefore, be addressed to them.

Alfred Field & Co., 93 Chambers street, New York, are calling attention in their announcement on page 66 to their Improved Double Action Acme Skates, No. 5. The point which they emphasize is that the lever works both right and left, so that each Skate can be used for either foot, and all parts are screwed, not riveted.

The Proposed Hardware Syndicate in England.

The movement for the organization of an association of ironmongers in England for the consolidation of their purchases, to which we referred in our last issue, is evidently regarded there with much interest, and a number of letters on the subject appear in the English journals. From the tenor of many of these it is evident that trade there is interfered with to a large extent by the competition of co-operative stores, the handling of Hardware by houses engaged in other lines of business, and the selling by the manufacturers direct to the consumers. At the same time there would appear to be on the part of the Hardware trade in that country a lack of enterprise and push, which, from the American standpoint, are regarded as essential to the successful prosecution of any business. There are also indications that the trade are in the habit of purchasing on time instead of for cash, and without that promptness in payment which is so important a factor in profitable buying. On this point a retired manufacturer publishes the following letter in the London *Ironmonger*, and it will be observed that the considerations to which he refers are equally applicable to trade on either side of the ocean:

There are certain classes of tradesmen—ironmongers in particular—who "wonder how it is they cannot sell as cheaply as, and compete with, others selling the same class of goods as themselves." The solution of the problem is easy and simple. The "Co-operative Stores," "Supply Associations," and "Give Away" tea shops are their greatest enemies, and these they have to compete with. How are they to

do it? Simply by trading in the same spirit, and under the same conditions, as their rivals—viz., liberal purchases, prompt payment, with "small profits and quick returns." But the grand secret lies in the buying and mode of payment. The three classes named above, as a rule, order largely and pay promptly, and thereby secure advantages from the concessions made to them by the manufacturers. It is only reasonable to infer that a manufacturer will gain a greater advantage from a liberal order with prompt payment than from several small orders with a deferred payment, though in the former case he may allow a greater discount; and this discount is the profit to the purchaser. But when the manufacturer supplies goods in small quantities, and is compelled to submit to deferred payment, has to pay a collector, and keep his books open for an unlimited time, it is surely unreasonable to suppose that his customer can compete with those trading under opposite conditions, as the manufacturer must reimburse himself for his loss of time, collector's fees, and loss of interest on his money by allowing his customer no discount at all; so that a sum must be added by the retailer to the price of the goods for his profit, instead of getting it off the manufacturer in the shape of discount. Under these circumstances the parties complaining cannot expect to be able to compete.

Another correspondent, referring to the proposed co-operation of ironmongers, suggests that a syndicate or society of subscribers or shareholders be formed, the objects of the association being as follows:

1. Open a central office or establishment in London, where samples and price lists of such manufacturers as confine themselves to the legitimate trade may be seen and consulted.
2. To supply the names of all so-called wholesale houses who have been known to sell to retail buyers.
3. To enter into arrangements with manufacturers for the supply for cash of large consignments of some (beginning with a few) of the leading articles regularly kept by ironmongers, to be distributed, also for cash, to the members.
4. To admit to membership those only who are *bona-fide* ironmongers and have served an apprenticeship to the trade.
5. To hold regular meetings, quarterly or otherwise, at which all members should be free to discuss matters of interest to the society and exchange ideas and information for their mutual benefit.

Business Tendencies.

The widespread interest in the questions suggested by the table of Fred. P. Straub & Co., Evansville, Ind., which we published several weeks ago, is evidenced by the communications we have in successive issues laid before our readers. In several of these this table was referred to, and suggestions were made in regard to the scope of the business done by the Evansville house, with the intimation that the significance of the table would depend somewhat upon the precise line of goods handled, and especially as to whether it related to a strictly Hardware business, or included also some of the related lines, which are frequently combined with the regular Hardware stock. As giving more precisely the import of the table, Fred. P. Straub & Co. advise us that they do not deal in Iron, Stoves, Farm Machinery, Wagons, Paints, Oils, Glass, &c., but confine their business strictly to Hardware, and sell at retail only. They add that as they pay cash (10 days or less) for all their goods they are in a position to buy where they can to the best advantage, whether from jobbers or manufacturers. It will thus be seen that the table refers to a representative Hardware business, and does not reflect the influence of dealing in other lines.

The St. Louis Screw Company, recently incorporated, at St. Louis, have elected the following officers: President, W. H. Hass; vice-president, C. Haffinger; secretary and treasurer, E. J. Miller. Additional machinery for their factory, consisting of automatic screw machines for the manufacture of set cap screws, has arrived from the East and is now being set up.

Chicago as a Hardware Center.

The great advantages possessed by Chicago as a point for the distribution of goods of all kinds over a vast territory are felt no less in the Hardware trade than in any other line. The vast system of inland navigation in which the great lakes constitute the most important part contributes its share toward keeping down the rate of freight on goods received at Chicago from the East, while no other city in the world has such a magnificent system of important railroads connecting it with the surrounding country. So many of these railroads compete for traffic over the same territory that a reasonable rate of freight is almost positively assured, with an almost equally positive guarantee that their rivalry will frequently cause wars in rates, reducing them still lower and always inuring to the benefit of Chicago business interests. The extension of Chicago trade has been co-equal with the extension of railroad facilities from Chicago to the West and Northwest, competition from other jobbing centers interfering to a considerable extent with its growth toward the East and South. But from Ohio to the Pacific Coast there is hardly a hamlet which is not regularly visited by some traveling salesman in the interest of a Chicago Hardware house.

I.—The Jobbing Trade.

The regular jobbers of Hardware in Chicago comprise six houses—namely, HIBBARD, SPENCER, BARTLETT & Co., THE WELLS AND NELLEGAR COMPANY, MARKLEY, ALLING & Co., A. F. SEEBERGER & Co., EDWIN HUNT'S SONS and HORTON, GILMORE, McWILLIAMS & Co. These houses transact a strictly jobbing business, making Shelf Hardware their leading line and adding to it such specialties or auxiliary branches as they find can be most easily or profitably handled. A large number of branch houses and manufacturers' agencies for handling Hardware specialties are located in Chicago, but they are not properly classed with jobbing houses and are separately enumerated below. Other Hardware houses, such as KELLOGG, JOHNSON & BLISS, ORR & LOCKETT, BULLARD & GORMLEY, S. J. SURDAM & Co., HODGE & HOMER, STANDART & Co., C. CARR & SONS, KEENE BROS., F. A. OSWALD & Co., ANDREW REAM, RENDTORFF HARDWARE COMPANY and F. A. STAUBER & Co., confine their attention mainly to the retail trade, but also sell large quantities of goods to contractors, builders and other heavy consumers, identifying themselves to that extent with the wholesale trade. In the same way GIBSON, PARISH & Co., E. N. BERBECKER, THE CHICAGO FURNITURE SUPPLY COMPANY, HEXER & BROCK-SCHMIDT and MARSHALL FIELD are connected with the Cabinet Hardware trade. A specialty of Cutlery is made by the HENRY SEARS COMPANY, RANDALL, HALL & Co. and C. B. JAMES, while a few firms, such as COLTER & Co., SCHUTT & Co., BUTLER BROS. and C. M. LININGTON, handle Penknives and one or two other lines of Cutlery in connection with other goods. In Tinware and House Furnishing Goods generally C. SIDNEY SHEPARD & Co., THE CHICAGO STAMPING COMPANY, DENNISON & HAMILTON and KIECKHEFER, BARTLING & Co. job a considerable line in addition to their own goods. GORDON M. RICHARDSON is also a jobber of Tinware.

The jobbers of Heavy Hardware, Wagon Stock, &c., comprise PARKHURST & WILKINSON, S. D. KIMBARK, KELLEY, MAUS & Co., MICHAEL GREENEBAUM'S SONS and CARRUTHERS & Co. Quite a number of special lines are represented in a wholesale way—as, for instance, Locksmiths', Bell-hangers' and Electrical Supplies—by J. F. WOLLENSAK, and Tools and Machinists' Supplies by C. H. BESLY & Co., but the entire list would be too long for the purposes of this article.

Recurring to the strictly Hardware jobbing houses, the following is a bird's-eye view of their character, the departments into which they are divided, the assortment of goods which they carry, the exclusive lines handled by each and the specialties made most prominent.

Hibbard, Spencer, Bartlett & Co. are jobbers and importers of Builders' Shelf and General Hardware, of Pressed, Pieced and Japanned Ware and of all kinds of Agricultural Implements, not including Machines. They are exclusive jobbing agents for the Ashtabula Tool Company's Diamond Steel goods. A large department is entirely devoted to American, English and German Cutlery. Silver-Plate Ware is carried in every variety. The line of staple goods embraces Steel Nails, Wire Nails, Sheet Iron, Metals, &c. One of the largest features of their business is the trade in Tin Plate, the stock being imported direct and sold largely to the jobbing trade. Their Gun department contains Guns, Rifles, Revolvers, Ammunition, Fishing Tackle, Base-Balls, Bicycles and every variety of sporting goods known to the trade. Their own importations of Belgian and English Guns, as well as all the leading American makes, are always in stock. They have recently taken the Chicago agency for the Rochester Lamps, and it has already proved a large business in itself. They are large buyers of Yerkes & Plumb's and Blood's lines of Hatchets, Yerkes & Plumb's and Maydole's Hammers, Henry Disston & Sons' Saws, Bailey and Stanley Iron Planes, the Sandusky Tool Company's Wood Planes, the American, Disston and Nicholson Files, Bradford Lock Works' complete line of Locks, Knobs, &c., Yale & Towne Mfg. Company's Yale Locks, Eagle Lock Company's Chest, Till, Trunk and Cabinet Locks, Wm. Wilcox & Co.'s Padlocks, Burden's Horsehoes, the Northwestern, Globe, Champion, Star, Putnam, Maud S. and C. B. K. Horse Nails, Western agents for Barney & Berry's Skates, sole United States dealers in the C. H. Conover Socket Strap, Scoops, Shovels and Spades, and also handle Ames' and Chisholm's Shovels, Spades and Scoops, Blood's and Maine Seythes, Vermont Snaths, Rowlett's Champion Lawn Mower, Philadelphia Mowers, &c. Their line further embraces Snaps, Bits and other Saddlery Hardware, Whips, Curry Combs, Brushes, &c., Sleigh Bells, Hand Sleighs, Rope and Mixed Paints. Barb Wire is a very important line, their jobbing trade in it being especially large. They carry the Welch Clock Company's complete line of Clocks and the Lalance & Grosjean Mfg. Company's Agate-Ware. Their line of dairy supplies, such as Railroad and Factory Can stock, Cream Pails and Gauges, Tin Plate for Milk Cans, &c., is particularly complete. In connection with this come Tinners' Tools and Machines and Tinners' Trimmings and a full line of Iron Stove Hollow-Ware, Brushes and Wooden-Ware. They are general Western agents for the Belding Mfg. Company's new Perfection Hardwood Refrigerator, agents for Heintz & Munchauer's complete line of Bird Cages, and carry a stock of Lanterns in great variety. They are represented by traveling men in every State and Territory from Ohio to

Pacific Coast, and their trade is each year increasing.

Markley, Alling & Co. have a full line of General Hardware, and also carry a stock of Ammunition and Fishing Tackle. They pay special attention to Cutlery, Tinner's Stock and Tin Plate. They also give considerable attention to smaller agricultural tools, the goods of the Otsego Fork Company being handled exclusively by them in the Chicago market. They sell goods in Missouri, Dakota, Montana, Idaho and Washington Territory, closely covering the States nearer home, reaching into Indiana.

The Wells & Nelligar Company, in addition to the general line of Hardware, are exclusive agents for Batcheller & Sons' Steel Goods, Jefferson Steel Cut Nails, Wetherald Wire Nails, and make specialties of Lyman Barb Wire, Guns, Ammunition, Sporting Goods, Fishing Tackle and Cutlery. It has always been the aim of this house to confine their assortment of goods to strictly first-class brands, such as Sargent's Shelf Goods, Disston's Saws, Nicholson and Disston Files, Branford Locks and Knobs, &c. Within the past 18 months this company have disposed of the entire stock of the late firm of Keith, Benham & Dezendorf, and now claim as complete an assortment as can be found in the stocks of their competitors. They state that their trade has increased throughout the whole of the present year, which speaks well for their energy and enterprise. They have representatives on the Pacific slope as well as in each of the States and Territories between that section and Chicago, their trade extending down into Arizona.

A. F. Seeberger & Co.'s house was established in 1864, and has built up a large trade in general Hardware, Metals, Tinner's Stock, &c. They are agents in the Chicago market for the Kelly Axe Company, Grand Rapids Refrigerator Company, Continental and Forest City Lawn Mowers, Great American Meat Choppers, Iowa Farming Tool Company, Empire Wringers, Hero Spring Hinges, Lawrence Steel Barn-Door Hangers, Marshall Sheep Shears, and the Tacks, Brads, &c., of the Stanley Works. Their stock embraces the American Screw Company's Screws, Sargent & Company's Shelf Hardware, Maydole's and Selsor's Hammers, Disston's Saws, Wheeler, Madden & Clemson's Saws, the Locks, Knobs, &c., of the Nimick & Britton Mfg. Company, Russell & Erwin Mfg. Company, and Mallory, Wheeler & Co., &c. In their Sporting Goods department they sell the celebrated Henry Leigh Guns, also all the leading makes of Fire-Arms and Ammunition. They carry stocks of the Norwich Cutlery Company's Pocket-Knives, Nonpareil Razors, &c. Their trade extends from Western Ohio to the Pacific Coast, while they receive orders for Sporting Goods, including Fishing Tackle and other belongings, from all over the South.

Edwin Hunt's Sons date their business back to 1833, when their house was founded in New York. It was removed to Chicago in 1847. They carry a general line of Hardware, Metals, Cutlery, Nails, &c., making a specialty of Shelf Goods. They are Northwestern agents for the Ice Tools manufactured by Wm. T. Wood & Co., of Boston, and maintain an ice dealers' supply depot. Their trade extends from Indiana to Dakota, over all the country naturally tributary to Chicago.

Horton, Gilmore, McWilliams & Co., as the successors of William Blair & Co., have a reputation for fair dealing, first quality goods, and low prices, which naturally gives them a very large mail order business. They carry a very large assortment of goods, embracing the lines of leading makers, covering new and de-

sirable goods in Hardware. The following fill a prominent place in their stock: Russell & Erwin Mfg. Company's Locks and Latches; Sargent & Co.'s General Hardware, Henry Disston & Sons' Saws and Files, Nicholson's Files, E. W. Gilmore's and Stanley Works' Hinges and Butts, Stanley Rule and Level Company's Tools, Charles Parker & Co.'s Line, Peck, Stow & Wilcox Company's Hardware and Tinner's Tools and Machines, D. Maydole & Co.'s Hammers, Lamson & Session Mfg. Company's Bolts, Union Steel Screw Company's Screws, Central Stamping Company's Stamped and Japanned Tinware, St. Louis Stamping Company's Granite-Ware, Douglas Axe Company's Axes and Tools, Oliver Ames & Co.'s Shovels, Spades and Scoops, and a host of other manufacturers' goods the names of which are familiar to all Hardware dealers. They are agents for the Jackson Steel and Wood Goods, and handle all descriptions of Farming Tools, but no machines. They control within the trade the sales of certain kinds of Farming Tools, House-Furnishing Goods, Horse Nails, Safety Bicycles, Door Hangers, Lawn Mowers and the Peerless Refrigerator, which will make its first appearance next season and in which they are preparing for a large business. They also deal largely in Wheeling Top Mill Nails, Wire Nails, Tin Plate, Sheet Iron, Burden's Horse Shoes and all kinds of heavy goods usually sold by the trade. They carry a large line of Lamps, Lanterns, common and fancy Clocks, Silver-plated Ware, Oxydized Silver and Gold-plated Jewelry, and Cutlery of every variety. They make a specialty of Revolvers and Ammunition, and not being members of the ammunition association sell largely of these goods at their own prices. They are now preparing a catalogue which will present some new features, and will prove valuable to the trade. The enterprise of the new firm has resulted in the extension of the trade of this house throughout all the Western States and Territories.

It may be said of all these houses, without exception, that they are not resting on their laurels, satisfied with past achievements and feeling secure in the possession of a large part of the Hardware trade of the country. They are alert, enterprising and progressive, ready to accommodate themselves to new conditions, and ever on the watch to introduce the newest and freshest ideas in the management of their business.

II.—Branch Houses and Agencies.

ST. LOUIS STAMPING CO., 16 Lake street, branch house.—*Granite-Ware*.

P. & F. CORBIN and CORBIN CABINET LOCK CO., 63 Washington street, Wm. G. Miller and John R. Scott, managers. Works at New Britain, Conn.—*Builders' Cabinet and Trunk Hardware*.

READING HARDWARE CO., 73 Wabash avenue, W. H. Bennett, manager. Factory at Reading, Pa.—*Builders' Hardware*. Also agents for

Buffalo Hammer Co., Buffalo, N. Y.—*Hammers*.

E. Jencks Mfg. Co., Pawtucket, R. I.—*Bright Wire Goods*.

Gwinner, Downey & Co., Hamilton, Ohio.—*Casters*.

YALE & TOWNE MFG. CO. (owning and operating the Yale Lock Mfg. Co., the Emery Scale Co. and the Western Crane Co.), 152 and 154 Wabash avenue., Wm. F. Donovan, manager.

ANSONIA BRASS AND COPPER CO., 64 Washington street, Gilbert M. Smith, agent.—*Brass and Copper Goods*.

LALANCE & GROSJEAN MFG. CO., Julien, P. Cordier, manager, 81 Michigan avenue.—*Agate-Ware*.

C. SIDNEY SHEPARD & Co., 23 and 25 Randolph street, branch of Sidney Shepard & Co., Buffalo, N. Y.—*Tin and Japanned-Ware*. Agents for

Austin, Obdyke & Co., Philadelphia.

—*Corrugated Conductor Pipe*.

Hatten, Galpin & Co., Binghamton,

N. Y.—*Eave-Troughs and Miter*.

New Haven Wire Goods Co., New

Haven.—*Wire Broiler and Toaster*.

H. Clayton & Co., Cincinnati.—*Alcohol*

Stoves.

Stuart-Peterson Co., Philadelphia.—

Enamelled Kettles and Saucepans.

H. R. Streeter & Co., Groton, N. Y.—

Sensible Sad Irons.

Yates & Co., Rockford.—*Store Polish*.

New Union Mfg. Co., Freeport, Ill.—

Coffee Mills.

Heins & Munschauer, Buffalo.—*Re-*

frigerators and Ice Chests.

Fred. W. Baker, Rochester, N. Y.—

Kedzie Water Filters.

They also job quite a variety of goods for which they do not have the exclusive sales agency.

J. J. CLEARY & Co., 154 Lake street, agents:

Clauss Shear Co., Fremont, Ohio.

Penna. Saw Mfg. Co., Philadelphia.

American Bit Brace Co., Buffalo.

St. Louis Refrigerator and Wooden

Gutter Co.

W. H. Parkin, Cleveland, Ohio.

Rock Falls Mfg. Co., Sterling, Ill.

MORTIMER McROBERTS, 115 Lake street, agent:

The Plume & Atwood Mfg. Co.,

Waterbury Conn.—*Brass and Cop-*

per Wire, &c.

Henderson & Harker Mfg. Co., Colum-

bus, Ohio.—*Oil Cans, Elbowes, &c.*

American Ring Co., Waterbury, Conn.

—*Furniture Trimmings*.

C. T. Ham Mfg. Co., Rochester, N. Y.

—*Tubular Lanterns, &c.*

Ridgway Refrigerator Mfg. Co., Phila-

delphia, Pa.—*Refrigerators and Ice-*

Cream Freezers.

American Wick Mfg. Co., 26 Broad-

way, New York.—*Kerosene Wicks*.

COOK LEVEL CO., 154 Lake street: factory, Watertown, N. Y.—*Levels*.

M. HECKLINGER, JR., 139 Lake street, agent:

Philip Townsend & Co., Philadelphia,

Pa.—*Wire Nails*.

O. L. BEARDSLEY, 92 Dearborn street, agent:

Paysop Mfg. Co., Chicago.—*Sash*

Locks, &c.

Belmont Nail Co., Wheeling, W. Va

Pittsburgh Wire-Nail Co., Pittsburgh.

Anderson Bolt Works, Anderson, Ind.

H. BUTMAN, 137 Lake street, agent:

Clinton Wire-Cloth Co., Clinton, Mass.

J. C. BENNETT, 121 Lake street, manager:

Western File Co., Beaver Falls, Pa.

L. G. BEERS, 148 Lake street, manager:

Gilbert & Bennett Mfg. Co., George-

town, Conn.—*Wire Goods*.

C. R. LAMENA, 154 Lake street, selling agent for

S. N. Brown & Co., Dayton, Ohio.

—*Wheels, Hubs, &c.*

OTIS, SKILLMAN & Co., 154 Lake street, agents:

The Mallory-Wheeler Co., New

Haven, Conn.—*Door Locks, &c.*

The Wm. Rogers Mfg. Co., Hartford,

Conn.—*Silver-Plated Ware*.

Ten Eyck Edge Tool Co., Cattaraug-

us, N. Y.—*Hatchets, &c.*

Cleveland Twist Drill Co., Cleveland,

Ohio.—*Drills, Taps, &c.*

Nashville Spoke and Handle Co.,

Nashville, Tenn.—*Axe Handles, &c.*

Union Mfg. Co., New Britain, Conn.

—*Butts, &c.*

Skillman Hardware Mfg. Co., Tren-

ton, N. J.—*Door Knobs, &c.*

- Palmer Hardware Mfg. Co., Troy, N. Y.—*Sash Pulleys*.
Chicago Sewing Machine Co., Chicago, Ill.—*Registers, &c.*
Hamblin & Russell Mfg. Co., Worcester, Mass.—*Wire Goods*.
Dunn Edge Tool Co., Oakland, Me.—*Scythes, Axes, &c.*
New Philadelphia Iron and Steel Co., New Philadelphia, Ohio.—*Sheet Iron and Steel*.
Geo. N. Pierce & Co., Buffalo, N. Y.—*Refrigerators, Cages, &c.*
Felix Sliding Door Hanger Co., Chicago.—*Hangers*.
- DENNISON & HAMILTON, 144-146 Lake street:
Simonds Mfg. Co., New York.—*Registers, &c.*
Palermo Mica Co., New York.—*Mica*.
Nubian Iron Enamel Co., Chicago.—*Iron Enamel*.
American Oil Stove Co., Gardner.
- BENNETT & SHIRK, 112-114 Lake street, agents:
Ball Bros., Glass Mfg. Co., Buffalo, N. Y.—*Cans, Tanks, &c.*
Ottumwa Cutlery Co., Ottumwa, Iowa.—*Cutlery*.
Geo. C. Beals, Buffalo, N. Y.—*Wire, &c.*
The Indiana Mfg. Co., Peru, Ind.—*Refrigerators*.
Standard Fiber-Ware Co., Mankato, Minn.—*Pails, Basins, &c.*
Reliance Edge Tool Co., Indianapolis, Ind.—*Axes, &c.*
- C. H. GURNEY & Co., 247-249 Lake street, agents:
Atha Tool Co., Newark, N. J.
Benjamin Atha & Co., Newark, N. J.
Newark Steel Works, Newark, N. J.
Jersey City Steel Co., Jersey City.
Northwestern Screw Co., Chicago.
Wm. H. Haskell Co., Pawtucket.
Penn Hardware Co., Reading, Pa.
Boston and Lockport Block Co., Lockport, N. Y.
The J. Barton Smith Co., Philadelphia, Pa.
H. Chapin's Son, Pine Meadow, Conn.
James Carter, Lockport, N. Y.
Syracuse Hardware Co., Syracuse.
Fisher & Norris, Trenton, N. J.
The Triumph Wringer Co., Keene.
Cronk Hanger Co., Elmira, N. Y.
Ryther Mfg. Co., Carthage, N. Y.
Joliet Iron and Brass Foundry Co., Joliet, Ill.
- ANTHONY FREEMAN, 139 Lake street, agent:
Canastota Knife Co., Canastota, N. Y.—*Pocket Cutlery*.
J. Wiss & Sons, Newark, N. J.—*Shears, Scissors, &c.*
A. F. Bannister & Co., Newark, N. J.—*Table Cutlery, &c.*
E. Andrews & Sons, Williamsport, Pa.—*Saws*.
Ray Hubbell Mfg. Co., Northville, N. Y.—*Oil Cloth Binding*.
Birmingham Plane Mfg. Co., Birmingham, Conn.
- Low & WOODRUFF, 121 Lake street, agents:
Braddock Wire Co., Rankin, Pa.
Lambert & Bishop, Wire Fence Co., Joliet, Ill.
- M. A. MIHILLS, 166 Lake street, agent:
Wetherald Wire Nail Co., Findlay, Ohio.
Wm. Scholhorn & Co., New Haven, Conn.
Sterling Wrench Co., Sterling, Ohio.
Ellrich Hardware Mfg. Co., Plantsville.
- A. Y. McDONALD MFG. Co., 168 Lake street.
Factory Dubuque, Iowa.—*Pumps and Plumbers' Supplies*. Also agents for Haines, Jones & Cadberry, Philadelphia.—*Plumbers' Supplies*.
- GEO. B. KERR, 208-210 Lake street, agent:
Scoville Mfg. Co., Waterbury, Conn.—*Metal Specialties*.
- THE UPSON NUT CO., 232 Lake street, branch house.
Factories Cleveland, Ohio, and Unionville, Conn.—*Nuts, Bolts and Carriage Hardware*.
- THE OSHKOSH PUMP CO., 154 Lake street, Eugene Smith, president.
Factory at Oshkosh, Wis.—*Iron Pumps and Well Specialties*.
- H. H. & C. L. MUNGER, 142 Lake street, agents:
E. C. Stearns & Co., Syracuse, N. Y.—*Door Hangers, &c.*
Syracuse Twist Drill Co., Syracuse.
Phoenix Caster Co., Indianapolis, Ind.
A. F. Pike Mfg. Co., Pike's Station, N. H.—*Oil Stones*.
Lufkin Rule Co., Cleveland, Ohio.
A. M. Bristol, Rochester, N. Y.—*Registers*.
Samson Cordage Works, Boston.
Moore & Barnes Mfg. Co., Phoenix, N. Y.—*Specialties*.
Hollenbeck Lock & Knob Co., Jordon, N. Y.
Lovell, Tracy & Co., Hartford, Conn.—*Oil*.
Climax Curry Comb Co., New York.
F. A. Reiher, Chicago.—*Transom Lifters*.
Wm. Gerwien, Chicago.—*Locks*.
J. H. Brown & Co., Chicago.—*Hog Rings*.
Michigan Wire Shovel Co., Niles, Mich.—*Picture Hangers*.
The Brinkerhoff Co., Auburn, N. Y.
- MARINETTE IRON WORKS CO., 212 Lake street:
Cameron Steam Pump Co., New York.
Cleveland, Brown & Co., Cleveland.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Hart Mfg. Co., Cleveland, Ohio.
Mfr's Governor Co., New York.
Michigan Lubricator Co., Detroit.
Detroit Lubricator Co., Detroit, Mich.
Edinburg Pulley Co., Edinburg, Ind.
Wiley & Russell Mfg. Co., Greenfield, Mass.
Montgomery Brass Mfg. Co., Cleveland.
Reliance Gauge Co., Cleveland.
Taunton Crucible Co., Taunton, Mass.
Bonney Vise Co., Clinton, Iowa.
Josiah Gates & Son, Lowell, Mass.
C. N. Coe, Worcester, Mass.
Challenge Machinery Co., Philadelphia.
Sterling Emery Wheel Co., New York.
Star Machine Co., Buffalo.
Newman Clock Co., New York.
Jenkins Bros., New York.
Celluloid Emery Wheel Co., New York.
Holland & Thompson Mfg. Co., St. Paul.
St. Paul Iron Co., St. Paul.
Claffen Mfg. Co., Cleveland.
Penberthy Injector Co., Detroit.
- W. McARTHUR, 25 Lake street, manager Western branch.
R. E. Dietz Co., New York.—*Lanterns*.
Steam Gauge and Lantern Co., Rochester, N. Y.—*Lanterns*.
- HENRY A. TAYLOR, 19 Lake street, manager Western branch American Screw Co., Providence, R. I.
- HENION & HUBBELL, 55 and 57 North Clinton street, agents, Silver & Deming Mfg. Co., Salem, Ohio.—*Pumps*.
- H. S. WALKER, manager Western department Hall Duplex Steam and Power Pumps, 8 and 10 South Canal street.—*Pumps*.
- GREGORY & DONOVAN, agents, 154 Lake street.—*Hardware Specialties*.
- NELSON B. WILLIAMS, Rookery Building, agent:
Hartman Steel Co., Beaver Falls.—*Wire, Wire Nails, Barb Wire, Steel, &c.*
Apollo Iron and Steel Co., Apollo, Pa.—*Sheet Iron and Steel and Galvanized Iron*.
- CLIFFORD J. ELLIS, Phenix Building, agent:
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.—*Wire, Barb Wire, Steel, &c.*
- UNION INDURATED FIBRE CO., general Western office and warehouse, 45 to 49 Wabash avenue; A. H. Prescott, manager. Factories: Portland and Skowhegan, Me.; Watertown, Mass.; Mechanicsville, N. Y.; Oswego, N. Y.; Lockport, N. Y., and Winona, Minn.
- FAIRBANKS, MORSE & Co., Lake and La Salle streets, branch house, for sale of Fairbanks' Scales. Sole agents for Eclipse Wind Mills, Sheffield Hand Cars, &c.; Hancock Inspirator, Smith-Vaile Pumps, Williams' Engines, Chandler & Taylor Engines, Snell & Maharg, Standard Electric Health Lift Co., &c.
- THE ANDREWS BROS. CO., 53 Dearborn street, John McLaughlan, manager Western office. Works at Haselton, Ohio.—*Sheet Iron, Bars, Bands, Hoops and Pig Iron*.
- T. S. CASEY & Co., 115 Dearborn street, agents for manufacturers of Steel Nails, Wire Nails, Roofing, &c.
- W. G. TALCOTT, 89 Lake street, agent for Alfred C. Rex & Co., Variety Iron Works, Philadelphia.
- J. W. CROSS, 115 Dearborn street, secretary H. C. Hart Mfg. Co., Detroit.—*Car Hardware*.
- WASHBURN & MOEN MFG. CO., 107 and 109 Lake street, H. B. Cragin, agent. Works at Worcester, Mass.—*Plain and Barb Wire, Bale Ties, &c.*
- HENRY DISSTON & SONS, 259 Randolph street, H. D. Nicholls, manager. Works at Tacony, Pa.—*Saws*.
- C. K. LUCE, 154 Lake street, agent:
Globe Nail Co., Boston.—*Horse Nails*.
- CHARLES HAWKINS, Phenix Building, agent for:
Brown, Bonnell & Co., Youngstown, Ohio.—*Nails, Bar Iron, &c.*
- PUTNAM NAIL CO., 235 Lake street, E. Brubaker manager.—*Horse Nails*.
- D. R. SPERRY & Co., 235 Lake street. Works at Batavia, Ill.—*Hardware Specialties*.
- S. L. BIGNALL HARDWARE CO., 233 Lake street. Works at St. Charles, Ill.—*Sad Irons, &c.*
- W. & B. DOUGLAS, 197 Lake street, Works at Middletown, Conn.—*Pumps*.
- M. T. MILES & SON, Phenix Building, agents for:
Anderson, Du Puy & Co., Pittsburgh;
John C. Schmidt, York, Pa.; also represent manufacturers of Nails, Springs, Carriage Axles, &c.—*Steel Chains*.
- A. GUSTORF, 92 La Salle street, agent for manufacturers of Hardware Specialties.
- JOHN A. ROEBLING'S SONS COMPANY AND NEW JERSEY WIRE CLOTH CO., 171 and 173 Lake street, George C. Bailey, manager. Works at Trenton, N. J.—*Wire, Wire Rope, &c.*
- GOULDS & AUSTIN, 167 and 169 Lake street, agents for:
Goulds Mfg. Company, Seneca Falls, N. Y.—*Iron Pumps, &c.*
- P. HAYDEN SADDLERY HARDWARE CO., 45 and 47 Lake street. Works at Columbus, Ohio.
- W. A. COMSTOCK, 31 Lake street, manufacturers' agent for sale of Hardware Specialties.

W. H. WALBRIDGE, 31 Lake street, manufacturers' agent for sale of Hardware Specialties.

KILMER MFG. CO., 543 State street. Works at Newburg, N. Y.—*Bale Ties*.

JONES & LAUGHLINS, West Lake and Canal streets. Works, Pittsburgh.—*Nails, Bars, Sheets, &c.*

WM. E. STOCKTON, 16 West Lake street, agent for:

Moorehead McCleane Co., Long & Co. and Singer, Nimick & Co., Pittsburgh.—*Galvanized Iron, Bar Iron, Steel, &c.*

JAMES W. ROSS, 123 Dearborn street, agent:

Whitaker Iron Co., Wheeling, W. Va.—*Sheet Iron*.

W. S. KESSLER & CO., 115 Dearborn street, agent for:

Toledo Bolt and Nut Co., Toledo, Ohio.—*Bolts, Nuts, Bars, &c.*

J. P. DABNEY, 239 and 241 Lake street, agent:

Taunton Tack Co., Taunton, Mass.—*Tacks, Nails and Rivets*.

W. M. MOONEY & CO., Western office 241 Lake street; factories, Montreal, Canada, and Ausable Chasm, Essex County, N. Y.—*Horse Nails*.

CHARLES HOWARD, 226 and 228 Lake street, manager Chicago office:

Deane Steam Pump Co., Holyoke, Mass.—*Pumps*.

A. W. KINGSLAND, 142 Lake street, general agent:

Ausable Horse Nail Co., New York.—*Horse Nails*.

WM. T. EGAN, 40 Dearborn street, agent:

P. L. Kimberly & Co., Sharon, Greenville and New Castle.—*Iron and Nails*.

Geo. W. Johnson, New Castle, Pa.—*Plates and Sheets*.

Etna Iron Works, Limited, New Castle, Pa.—*Nails*.

W. H. SILLS, 116 Lake street, agent:

Palmer Mfg. Co., New York.

Matthai, Ingram & Co., Baltimore.

James Hill Mfg. Co., Providence.

Fred. J. Meyers Mfg. Co., Covington, Ky.

New York Stamping Co., Brooklyn.

N. D. PRATT, 91 Lake street, Western agent:

Cleveland Rolling Mill Co., Cleveland.—*Iron, Steel, Wire, &c.*

Union Steel Screw Co., Cleveland.—*Screws and Tacks*.

KIECKHEFER, BARTLING & CO., 149 Lake street, Chicago, branch Kieckhefer Bros., Milwaukee.—*Timware*.

BORDEN, SELLECK & CO., 48 and 50 Lake street, general agents Howe Scales and Troemner Scales.—*Scales*.

W. A. TOLES, 88 Lake street, manager Western Wheeler Reflector Co., Boston and Philadelphia.—*Lamps, Lanterns, &c.*

J. WHITCOMB COTTON, 88 Lake street:

American Tube Works, Boston, Mass.—*Copper Tubes*.

CUTLER, WOODROUGH & CO., 19 Lake street, Western agents.

Nashua Lock Company, Nashua, N. H.

Lockwood Mfg. Co., South Norwalk, Conn.

Dibble Mfg. Co., Trenton, N. J.

Yale Caster Co., New Haven, Conn.

Underhill Edge Tool Co., Nashua, N. H.

Woodrough & McParlin, Cincinnati.

Henry Cheney Hammer Co., Little Falls, N. Y.

Arcade File Works, Sing Sing, N. Y.

C. J. Kimball & Son, Bennington, Vt.

Hobart B. Ives & Co., New Haven.

C. E. Jennings & Co., New York.

Chicago Sewing Machine Co., Chicago.

CHAS. H. BESLEY & CO., 175 and 177 Lake street, agents:

Buchanan, Bolt & Co., Holyoke, Mass.—*Brass Wire Cloth*.

Kearney & Foote Co., New York.—*Files*.

W. F. & Jno. Barnes Co., Rockford, Ill.—*Lathes*.

Sigourney Tool Co., Hartford, Conn.—*Machinery*.

Hendricks Bros., New York.—*Copper*.

Russell & Erwin Mfg. Co., New York.—*Machine Screws*.

Boston Blower Co., Boston, Mass.—*Exhausts and Blowers*.

Diamond Machine Co., Providence, R. I.—*Grinding Machinery*.

Sebastian, May & Co., Cincinnati, Ohio.—*Machinery*.

Magnolia Anti-Friction Metal Co., New York.—*Babbitt Metal*.

S. Ashton Hand Mfg. Co., Toughkenamon, Pa.—*Lathes*.

Prentiss Tool and Supply Co., New York.—*Shapers*.

Hanson, Van Winkle & Co., Newark, N. J.—*Electro Platers' and Polishers' Supplies*.

Brown & Sharpe Mfg. Co., Providence, R. I.—*Standard Gears*.

Celluloid Varnish Co., Newark, N. J.—*Lacquers*.

WELLS GOODHUE, 115 Dearborn street, agent:

Hopkins & Dickinson Mfg. Co., Brooklyn, N. Y.—*Locks and Builders' Hardware*.

GEO. G. SPENCER, 115 Dearborn street, agent:

Laughlin Nail Co., Wheeling, W. Va.—*Nails and Spikes*.

Etna Iron and Steel Co., Bridgeport, Ohio.—*Bars, Angles, &c.*

J. E. DAVIS & CO., 115 Dearborn street, agent:

Tower & Lamont, Rochester, N. Y.—*Razor Strops*.

S. Draper & Sons, Troy, N. Y.—*Fish Lines*.

E. Blair, Bucyrus, Ohio.—*Hog Ringers*.

Chattanooga Tool Co., Chattanooga, Tenn.—*Hoes, Shovels, &c.*

I. F. Force, New Albany, Ind.—*Handles*.

Union Soapstone Co., Francetown, N. H.—*Foot-Warmers*.

Starr Bros. Bell Co., E. Hampton, Conn.—*Small Bells*.

Cummings & Hosack, Fredericktown, Ohio.—*Farm Bells*.

Schencks Adj. Fire Back Co., Chicago.—*Fire Backs, Screw Cases, &c.*

Empire Knife Co., W. Winsted, Conn.—*Shears and Corkscrews*.

Painesville Metal Binding Co., Painesville, Ohio.—*Binding*.

A. W. Bishop, Berea, Ohio.—*Animal Pokes*.

Gibbs Lawn Rake Co., Canton, Ohio.—*Rakes and Post-Hole Diggers*.

C. E. TRIPP, Phenix Building, agent for

HP Nail Co., Cleveland.—*Wire Nails*.

A. French Spring Co., Pittsburgh.—*Springs*.

SAMUEL E. BROWN, Phenix Building, agent for Cleveland Hardware Co., Cleveland.—*Wagon and Carriage Hardware*.

The Rights of Employees.

A writer in a recent issue of the *Merchants' Review* presents the following views on the treatment which should be accorded salesmen in the employ of retail merchants in all branches of trade:

As a retail business of any magnitude cannot be conducted without the help of clerks, and as the proprietor must depend upon these assistants in a large measure as his representatives, it follows that the treatment of these important adjuncts of

the retail business must be a matter for serious consideration with the merchant. Clerks have it in their power to increase the business of their employers by proper attention to the wants of their patrons and those small acts of politeness to the fair sex, which are as a rule so highly appreciated, or they can drive away the very best class of customers by surly or inattentive conduct, and at the same time escape reproof because the fact does not come to the notice of the employer. Some young men are so incapable naturally that the most rigid training can never fit them for a position behind the counter, though they may shine in other occupations. The merchant employing a large staff of clerks sometimes finds specimens of each class among them—the ill-tempered, the thoughtless and the willing but incapable. Then it is that his capacity for management, his executive ability and knowledge of human nature must come into play, and the worthless clerks be weeded out, while the capable but thoughtless are reproofed and instructed.

The easiest plan at first thought would seem to be summary dismissal of every assistant not first class, but the experienced retainer is aware of the difficulty of obtaining a staff of good assistants ready to his hands, and knows that he must train them himself in many cases. Some clerks are ruined by harsh and tyrannical treatment, others by slack discipline, but the employer who is firm yet considerate of the rights of his employees should have little trouble in protecting his business against the injury resulting from the shortcomings complained of by many retailers. Constant vigilance is necessary or the merchant will never detect the faults that give offence to his patrons, but he ought not to expect too much from his assistants, as for instance that they will take the same interest in the business that he does himself. They ought, of course, to do so, but human nature is such that hardly one in a thousand will be found perfect in this respect. When a merchant finds his clerks willing, industrious, honest and affable to his patrons, he should by all means cherish them, for he is more fortunate than the majority of his fellow merchants. The minor faults of young men can generally be eradicated by careful training, which, if successful, will repay the dealer for his trouble. In all cases, kind and considerate, but firm treatment gives the most successful results, and it is not to be wondered at that employers who adopt a different policy are the loudest in complaint of the faults of the whole race of clerks.

The H. C. Frick Coke Company, of Pittsburgh, have purchased within the last few days a valuable piece of property at the corner of Garrison and Penn avenues, in that city. It is the intention of the firm to erect on the site a costly and extensive office building, the lower part to be used by the H. C. Frick Coke Company as offices, while the upper floors will be rented out for the same purposes. Work on the building will probably be commenced in a short time.

The Adams Coke Oven Bottom Mfg. Company was organized in Pittsburgh last week, with a capital stock of \$50,000, and a charter will at once be applied for. The object of the company is the manufacture of a false bottom for coke ovens, patented by Mr. A. Adams. The bottom is to be opened by hydraulic pressure, and by its aid it is claimed that one man will be able to draw 40 ovens per day. At present the most that one man can draw in a day is four ovens. The company propose charging \$15 per year royalty for the use of their invention. The members of the company are A. Adams, Lehman Suear, John Donahoe, John Adams and Samuel Truby.

The Eureka Spring-Toothed Harrow.

This harrow is manufactured by the Eureka Mower Company, Utica, N. Y. It is illustrated in the cut, Fig. 1, given herewith. The manufacturers call atten-

tion to its light draft, which is not, however, at the expense of strength or durability, as the channel form of steel used in the draft bars is referred to as giving it exceptional strength. They also claim that the harrow has light draft, from the fact the frame is 3 inches higher from the ground than other harrows, and will not bury itself. The two parts of the harrow are hinged together with an oblong loop upon one side and an eye or stud upon the other, fastened with a spring key and

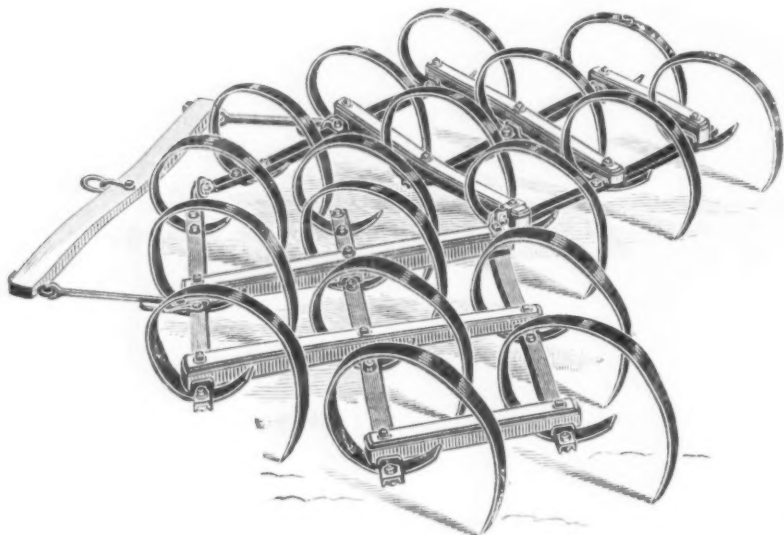


Fig. 1.—The Eureka Spring-Toothed Harrow.

ment of the teeth, so that in removing one or all of the teeth the frame remains the same.

ent of the teeth, so that in removing one or all of the teeth the frame remains the same.

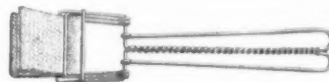
Lawn Rakes.

We represent herewith the Champion Wheel and Champion Reversible Lawn Rakes, which are put on the market

teeth, and of such a form as to prevent their tearing the sod. The length of the teeth and the width of the rake are also alluded to. The point is also made that they will not rust, as all the metal parts are galvanized. Fig. 1 represents the Champion wheel rake with reversible handle. The manufacturers explain that the handle, being reversible, gives the rake the desirable feature of being both a grass and a leaf rake, the pointed teeth being adapted to grass and the back rake reversed on handle forming a set of bowed teeth principally adapted to raking leaves in the fall of the year. The wheel is alluded to as adding to the ease of working the rake, also protecting the sod. Fig. 2 represents a similar rake, the wheel being omitted and the handle differently attached. The rake, as shown, is reversible and the teeth on either side can be used. Its special adaptation as a lawn rake is mentioned by the manufacturers, as well as the low price at which it is offered to the trade.

Pan and Griddle Greaser.

The accompanying illustration represents an article put on the market by Woods, Sherwood & Co., Lowell, Mass.



Pan and Griddle Greaser.

It is designated as Mrs. Gray's Patent Pan and Griddle Greaser. As indicated in the cut, it is made of wire and is about 7½ inches in length. It is so constructed as

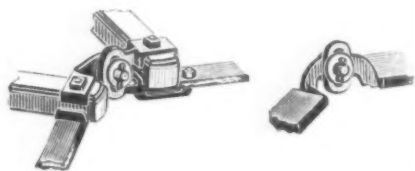


Fig. 2.—Form of Hinge.

washer, Fig. 2. The advantage of this joint is referred to as being that upon rough or uneven ground either half of the harrow is conformable to the surface. The tooth is fastened with a malleable-iron clip, shown in Fig. 3, by means of two bolts, the tooth seated upon the walls of the channel bar and the clip spanning it and fitted into the channel, but not resting upon the bottom of it. When the bolts are drawn the clip secures the tooth

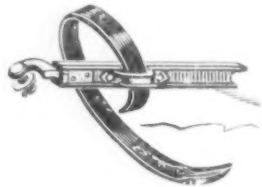


Fig. 3.—Method of Attaching Teeth.

firmly. In fastening the frame together malleable-iron saddles are used, in which the draft bars and wood cross-beams are secured by bolts. These saddles have flanges upon the upper and lower sides to take the channel steel draft bar and the wood pieces at each intersection. This

inserted, it will be observed, through a tube, in which they are securely fastened. They are made of the shape represented to prevent the clogging of the

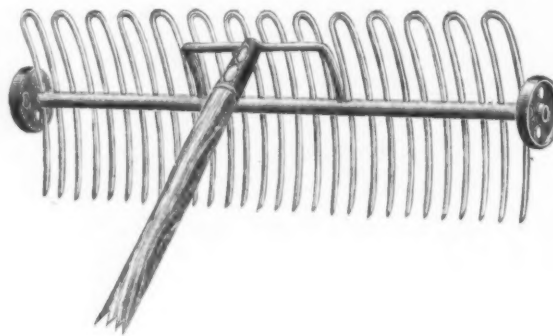


Fig. 1.—Champion Wheel Lawn Rake.

by the Champion Lawn Rake Company, Canton, Ohio. The teeth of these rakes are made of steel wire and are

to hold firmly the greaser proper and permit the substitution of a new one when desired. It is referred to by the manu-

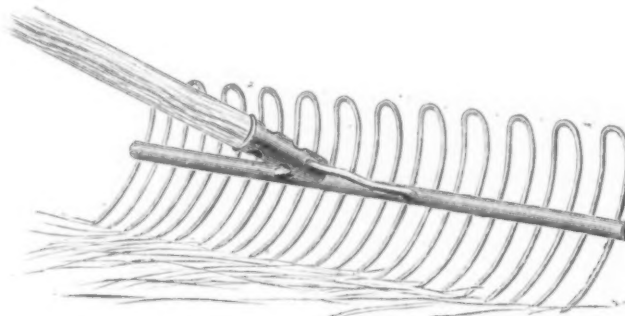


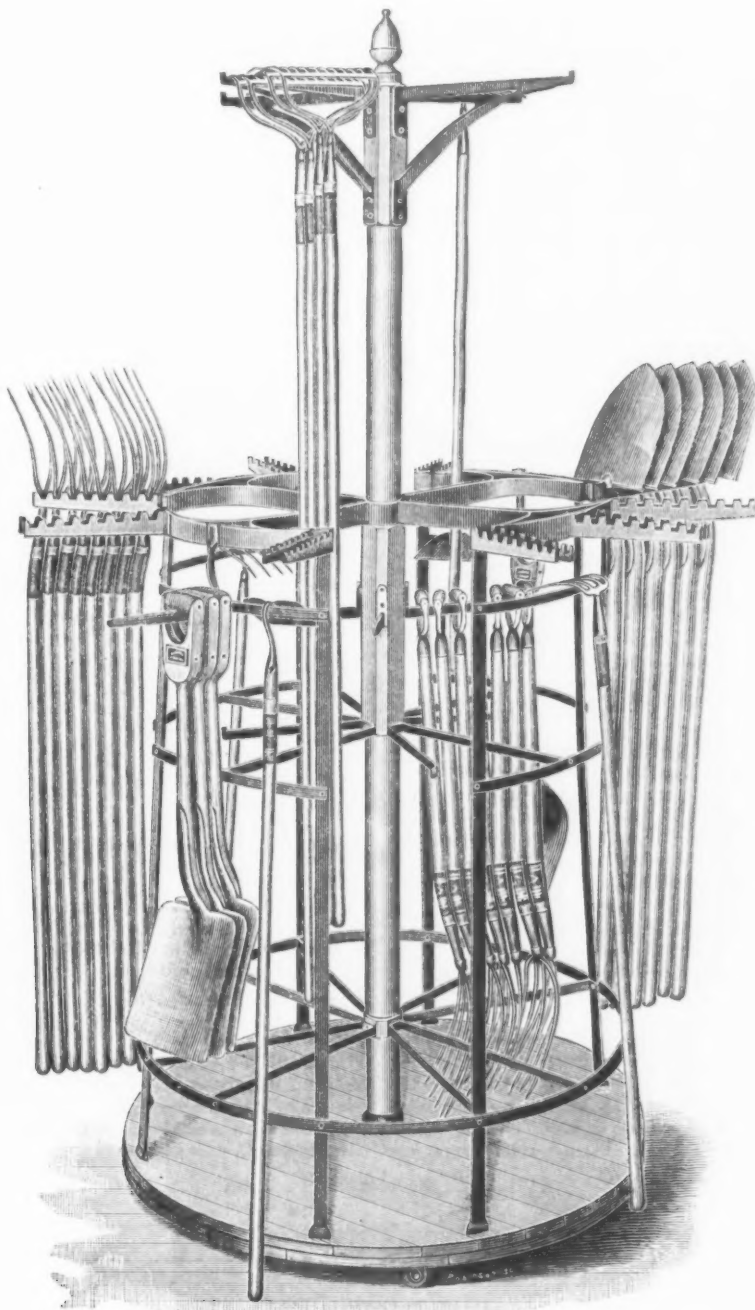
Fig. 2.—Champion Reversible Lawn Rake.

facturers as giving satisfaction and serving a convenient purpose, making it a desirable article in the kitchen and securing a ready sale.

Herrick's Patent Tool Rack.

The accompanying illustration represents Herrick's Patent Tool Rack, which is manufactured by F. A. Herrick & Co., 228 Second street Jackson, Mich. This

12 Long Shovel Handles, 12 Long Spade Handles, 12 Long Rake Handles, 12 Hoe Handles, 12 Long Manure-Fork Handles, 12 Long Hay-Fork Handles, 8 D-Fork Handles and 8 D-Shovel Handles. It will thus be seen that the rack accommodates a



Herrick's Patent Tool Rack.

rack is made entirely of iron, except the posts and platform, and is mounted with heavy truck casters so that it can be moved at will to any part of the store. The shovel and fork brackets slip into a dovetail on the rack, and can be interchanged at will by simply lifting out of socket. They are notched, it will be observed, on top so that each tool is held securely in its space. The handles are intended to stand on end on the platform and are held in place by the V-shaped brackets. The rack is described as strong, thoroughly screwed and bolted together, the woodwork being neatly painted a bright red, and all ironwork japanned, making it very attractive in appearance. The room necessary for the accommodation of the rack is a space about 5 feet square. The capacity of the rack is stated to be as follows: 32 D-Handle Shovels, 12 Long Handle Shovels, 48 Long Handle Forks, 16 D-Handle Forks, 24 Rakes, 36 Hoes, 18 Potato Hooks, 18 Manure Hooks,

large assortment of the goods for which it is intended.

Heavy Sleigh-Shaft Coupling.

The accompanying illustration represents a new heavy sleigh shaft coupling,



Heavy Sleigh Shaft Coupling.

which is put on the market by Butts & Ordway, 145 and 147 Pearl street, Boston, Mass. Its general construction is clearly shown in the cut. Special attention is called to the fact that it is made of heavy

iron of the best quality and well-finished and fitted. The couplings are made so that they can be fitted to almost any heavy sleigh or single or double runner pung. In order to give a clear idea of the size and adaptation of the coupling we would add that from A to B is 8 inches; from A or B to C, 6½ inches; from C to D 10 inches; from A or B to D 15½ inches, diameter at E 1½ inch.

Wing's Improved Pail Ear.

I. A. Weston & Co., Syracuse, N. Y., are putting on the market Wing's Improved Pail Ear, which is represented in the accompanying cut, Fig. 1, its use being indicated in Fig. 2. The ear is



Fig. 1.—Wing's Improved Pail Ear.

formed of bent metal and perforated as shown in Fig. 1. The object of this pail ear is to provide a support by which the pail can be held while milking, thereby preventing it from coming in contact with the ground and also guarding against its being tipped over. The curved arm projects outward away from the pail and forms

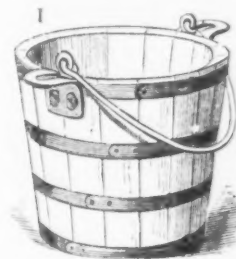


Fig. 2.—Wing's Pail Ear Applied.

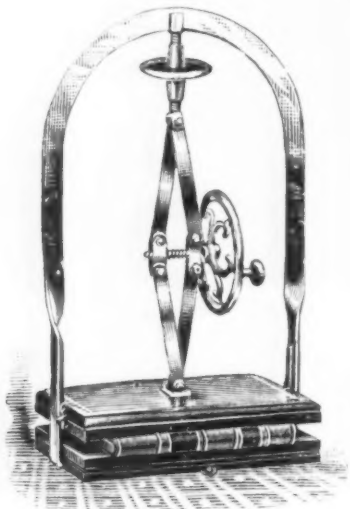
a support by means of which the pail may be held in position between the knees of the milkman without the necessity of much pressure on its sides.

The fate of the railway tunnel between Denmark and Sweden has practically been decided, the joint Swedish-Danish Commission appointed to report upon the project having recommended its rejection, at all events in its present form. The proposal for a tunnel was made by a syndicate of French financiers, and provided for a railway tunnel from a point in the island of Amager, near Copenhagen, to a point near Malmo, on the Swedish coast, the ap-

plicants for the concession maintaining that such a connecting link between the railway systems of Denmark and Sweden could not fail to develop the traffic between the two countries.

The Improved Easy Copying Press.

This article is made by the Easy Copying Press Company, Detroit, Mich., for whom Danforth & Pike, Boston, Mass., are agents. The bed is made of hardwood, $1\frac{1}{2}$ inches thick, provided with wrought angle irons on each end to strengthen it, the follower being treated similarly. The arched frame is steel, thus giving the requisite strength, and the top screw piece riveted to the frame is forged steel. The four jointed pieces and other connections are wrought iron. The man-



The Improved Easy Copying Press.

ufacturers make the point that thus there is no cast iron about the press except the wheels. It will be observed that the press is easily adjusted to books of different thickness. Its strength, simplicity and the ease with which it is worked are the advantages which are especially mentioned. It is made in different sizes, ranging from 10 x 13 to 18 x 22, and finished either painted plain, painted and striped, half nickel or full nickel.

New Metallic Lathing.

Prominent among the exhibits at the American Institute Fair, New York, now in session, is a miniature building, lathed and plastered, in the construction of which is employed what is known as the Hayes System of Metallic Lathing, Furring, &c., an invention that has recently

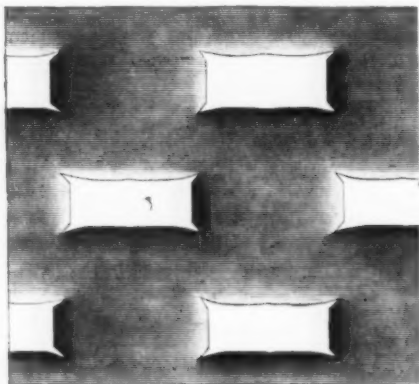


Fig. 1.—Back Elevation of a Portion of Perforated Sheet for Lathing.

been introduced by George Hayes, the well-known manufacturer of skylights and other glazed structures, of 71 Eighth avenue, New York. From even casual inspection it is evident that the improvement possesses more than ordinary merit.

Briefly, the invention consists of a sheet of iron or other metal perforated in such a form as to provide holes for the clinch of the plaster, and with burrs turned outward in a way to use the punching, to still further hold

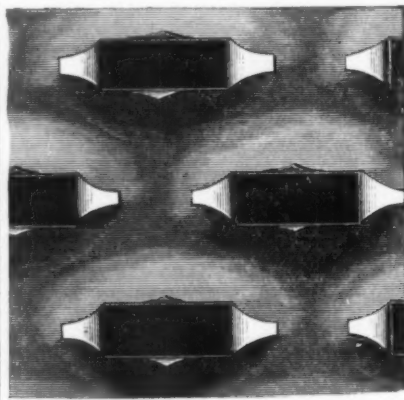


Fig. 2.—Elevation of Front of Portion of Perforated Sheet.

the mortar in place. Referring to the engravings, Fig. 1 shows a back elevation of the lathing, and indicates how the holes are punched. Fig. 2, on the other hand, is a section of the front elevation of a sheet of the lathing. The lathing is manufactured out of sheets of metal 40 x 96 inches or less in size, over the surface of which, at near intervals, are openings $\frac{5}{16}$ inch wide by $\frac{3}{4}$ inch long, produced by punching, as already mentioned. The flanges around the openings are pressed forward and curled outward, forming lips or hooks which clinch or hold the mortar to the surface of the sheets, while at the base of each opening there is formed a matrix into which the mortar is pressed, and by which perfect dovetailed clinches or bonds are obtained. The process, it is pointed out, imparts to the sheets an undulated surface, giving additional strength thereto. The mortar or plastering material is spread over the surface of the sheets, embedding the lips and hooks and filling the matrix, thereby, it is claimed, permitting a degree of coalescence which insures perfect and substantial work. The inventor points out that there is an entire freedom from expansion or other organic action, which would be liable to disrupt, strain or in any



Fig. 3.—Horizontal Cross Section Corresponding to the Above.

other way injure the bond. Cracking or falling away of the surface of the wall or ceiling, under any circumstances, it is claimed, is impossible. So solid is the coating that it can only be removed by picking it off in particles. Among the advantages to which attention is prominently directed we note the following: Less mortar is used than upon any other fire-proof lathing; the mortar may be applied stiffer than is the ordinary practice; scratch coating is entirely dispensed with; for one coat work this lathing affords an effectual finish; less hair, and shorter hair than commonly employed, may be successfully used. It is claimed, further, that by plastering with a good quality of gauged material a good result may be obtained without any hair. Figs. 3 and 4 of the engravings show a section of the lathing, a portion being covered with the first coat, and a portion of this, in turn,

being hard finished. In connection with this invention Mr. Hayes has perfected various architectural features which will be appreciated by builders in general. The lathing sheets can be readily bent to internal and external angles, and when so bent adapt themselves to any form of combined lathing, furring and screeding, and also to meet certain features in architecture, such as pilasters, columns, niches, groins, cornices, bases, angles, trimmings, &c. In the pamphlet which the inventor has issued, several engravings are presented which illustrate this feature. One application of this improvement, which will be very generally appreciated by those of our readers who have to do with office buildings and similar structures, is in the construction of fire-proof partitions.



Fig. 4.—Vertical Section through Finished Portion.

In his description, the inventor says that this system of lathing admits of the construction of strong partitions of from $1\frac{1}{2}$ inches thickness, upward, with double-plastered faces. The partitions are made by forming in the lathing sheets which, by virtue of the peculiar punctures, already have rigidity, a series of ribs such as are made for furring, and which are secured to each other back to back, and, when necessary for an

increase in strength, reinforced with a framework of band or bar iron or with angle or T-iron. The lathing is secured to the frame by wire or suitable clamps. The plastering on both sides aids in binding the whole together, so that very substantial walls are the results. The sheet, punctured as above described, are furnished in plain iron dipped in a lime coating, or dipped in asphaltum, or galvanized. As lime is a well-known preservative of iron, it is claimed that plain iron with a coating of lime is the most advantageous to use. The merchantable size of the sheets is 30 x 96 inches. It is claimed that the labor in applying this material to the walls is very much less than what is required in putting in plaster, wooden lathing, and it is further claimed that the employment of this material greatly adds to the strength of the building, in the fact that it braces and stiffens the walls.

CURRENT HARDWARE PRICES.

DECEMBER 5, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, 1000—	
Black & Goldmark	50¢
F. L. Waterproof, 1-10's	50¢
H. B. Trimmed Edge, 1-10's	50¢
H. B. Ground Edge, Central Fire, 1-10's	70¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	50¢
G. D.	25¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	50¢
Cent. Fire Group	70¢
Double Waterproof	1.40
Double Waterproof, in 1-10's	1.40
S. B. Genuine Imported	45¢
Key's S. B.	54¢
Key's S. B. Waterproof, Central Fire	1.40

Cartridges—

Rim Fire Cartridges	dis 50¢ & 2¢
Rim Fire Military	dis 15¢ & 2¢
Central Fire Pistol and Rifle	dis 25¢ & 2¢
Central Fire, Military & Sporting	dis 15¢ & 2¢
Blank Cartridges, except 22 and 33 cal., an additional 10¢ over above discounts	
Blank Cartridges, 22 cal.	\$ 75, dis 2¢
Blank Cartridges, 32 cal.	\$ 50, dis 2¢
Primed Shells and Bullets	dis 15¢ & 2¢
B. B. Caps, Round Ball	\$1.75, dis 2¢
B. B. Caps, Conical Ball, Swaged	\$2.00, dis 2¢

Primers—

Bergan Primers all sizes, and B. L. Caps (for Sturtevant Shells)	\$1.00, dis 2¢
All other Primers, all sizes	\$1.20, dis 2¢

Shells—

First quality, 4, 8, 10 and 12 gauge	dis 25¢ & 10¢ & 2¢
First quality, 14, 16 and 20 gauge (\$10 list)	dis 30¢ & 10¢ & 2¢
Star, Club, Rival and 10 gauge, \$9 list	dis 33¢
Climax Brand, 12 gauge, \$8 list	dis 30¢
Club, Rival and Climax Brands, 14, 16 and 20 gauge	dis 30¢ & 10¢ & 2¢
Seibold's Combination Shot Shells	dis 15¢ & 2¢
Brass Shot Shells, 1st quality	dis 60¢ & 2¢
Brass Shot Shells, Club, Rival, Climax	dis 65¢ & 2¢
A. B. & C. Co., I. X. L., 10 & 12 gauge	dis 40¢ & 5¢ & 2¢
A. B. & C. Co., "Special," 14 gauge	dis 30¢ & 10¢ & 5¢ & 2¢
A. B. & C. Co., "Special," 10 gauge	dis 40¢ & 10¢ & 2¢
Fowler's Patent, 10 & 12 gauge, \$100	\$3.75

Shells Loaded—

List No. 19 1887	dis 20¢ & 10¢
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Wads—

U. M. C. & W. R. A.—B. E., 11 up	\$2.00
U. M. C. & W. R. A.—B. E., 9 & 10	2.30
U. M. C. & W. R. A.—B. E., 7 & 8	2.60
U. M. C. & W. R. A.—P. E., 11 up	2.10
U. M. C. & W. R. A.—P. E., 9 & 10	4.00
U. M. C. & W. R. A.—P. E., 7 & 8	4.00
Key's B. E., 11 up	\$1.75
Key's P. E., 11 & 20	\$2.80

Anvils—

Eagle Anvil	\$ 104, dis 20¢ & 20¢
Peter Wright's	94¢
Armitage's Mouse Hole	11¢
Armitage Mouse Hole, Extra	11¢
Trenton	94¢
Wilkinson's	94¢
J. & Riley Carr. Patent Solid	11¢

Anvil Vise and Drill—

Millers Falls Co.	\$18.00, dis 20¢
Cheney Anvil and Vise	dis 25¢
Allen Combined Anvil and Vise	\$3, dis 40¢ & 10¢
Moore & Barnes Mfg. Co.	dis 33¢

Apple Parers.

Advance	\$ doz. \$4.75
Antrim Combination	\$ doz. 5.50
Baldwin	\$ doz. 5.25
Champion	\$ d 2. 7.25
Eureka, 1888	each 17.00
Family Bay State	\$ doz. 12.00
Gem	\$ doz. 5.25
Gold Medal	\$ doz. 4.00
Hudson's New '88	\$ doz. 3.75
Ideal	\$ doz. 4.75
Improved Bay State	\$ doz. 3.00
Little Star	\$ doz. 5.00
Monarch	\$ doz. 13.50
New Lightning	\$ doz. 5.50
Orion	\$ doz. 4.00
Penn.	\$ doz. 4.00
Perfection	\$ doz. 4.00
Pomona	\$ doz. 4.00
Rocking Table	\$ doz. 8.00
Turntable	\$ doz. 4.50
Victor	\$ doz. 13.50
Waverly	\$ doz. 4.50
White Mountain	\$ doz. 4.50
72	\$ doz. 4.25
78	\$ doz. 5.75
78	\$ doz. 6.50

Augers and Bits.

Douglas Mfg. Co.	
Wm. A. Ives Co.	dis 70¢
Humphreysville Mfg. Co.	dis 70¢
French, Swift & Co. (F. H. Beecher)	dis 70¢
Cook's, Douglas Mfg. Co.	dis 55¢
Cook's, New Haven Copper Co.	dis 50¢ & 10¢ & 50¢ & 10¢
Ives' Circular Lip	dis 60¢
Patent Solid Head	dis 80¢
C. E. Jennings & Co., No. 10, extension lip	dis 40¢
C. E. Jennings & Co., No. 30	dis 60¢
C. E. Jennings & Co., Auger Bits, in fancy boxes, set, 3/4, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	dis 20¢
Lewis' Patent Single Twist	dis 45¢
Russell Jennings' Augers and Bits	dis 25¢
Imitation Jennings' Bits (new list)	dis 60¢ & 25¢
Pugh's Black	dis 20¢
Car Bit	dis 50¢ & 10¢ & 60¢
L'Hommedieu Car Bits	dis 15¢ & 10¢
Forster Pat. Auger Bits	dis 10¢
Bellow Augers—	
Ives	dis 25¢ & 10¢
French, Swift & Co.	dis 25¢ & 10¢
Douglas	dis 40¢ & 10¢
Booney's Adjustable	dis 40¢ & 10¢
Stearns	dis 40¢ & 10¢
Ives' Expansive, each \$4.50	dis 50¢ & 10¢
Universal Expansive, each \$4.50	dis 20¢
Wood's	dis 35¢ & 25¢ & 10¢

Capacities and—

Clark's small, 113; large, 126	dis 35¢ & 35¢
Ives' No. 4, per doz. 100	dis 35¢ & 40¢
Swan's	dis 40¢
Stearns, No. 1, 22; No. 2, 22	dis 35¢
Stearns' No. 2, 48	dis 20¢
Double Bits—	
Common	\$ gross \$2.75 @ \$3.25
Diamond	\$ doz. \$1.10, dis 25¢ & 10¢
"Bee"	dis 25¢ & 25¢ & 5¢
Double Cut, Shepardson's	dis 45¢ & 45¢ & 5¢
Double Cut, Ct. Valley Mfg. Co.	dis 30¢ & 10¢
Double Cut, Hartwell's, \$ gro.	\$5.25
Double Cut, Douglas's	dis 40¢ & 10¢
Double Cut, Ives'	dis 60¢ & 60¢ & 5¢

Bit Stock Drills—

Morse Twist Drills	dis 50¢ & 10¢ & 5¢
Standard	dis 50¢ & 10¢ & 5¢
Cleveland	dis 50¢ & 10¢ & 5¢
Syracuse, for metal	dis 50¢ & 10¢ & 5¢
Syracuse, for wood (wood list)	dis 30¢ & 30¢ & 5¢
Williams' or Holt's, for metal	dis 50¢ & 10¢ & 5¢
Williams' or Holt's, for wood	dis 40¢ & 10¢

Augers and Bits—

L'Hommedieu's	dis 15¢ & 10¢ @ 15¢ & 10¢ & 5¢
Watrous's	dis 15¢ & 10¢ @ 15¢ & 10¢ & 0¢
Snell's	dis 15¢ & 10¢ @ 15¢ & 10¢ & 5¢
Snell's Ship Auger Pat. Car Bits	dis 15¢ & 10¢ @ 15¢ & 10¢ & 5¢

Awl Hatts.

Swing, Brass Ferrule	\$3.50 \$ gross—dis 45¢ & 10¢
Patent Sewing, Short	\$1.00 \$ doz—dis 40¢ & 10¢
Patent Sewing, Long	\$1.20 \$ doz—net
Patent Peg, Plain Top	\$1.00 \$ gross—dis 45¢ & 10¢
Patent Peg, Leather Top	\$1.20 \$ gross—dis 45¢ & 10¢

Awls, Brad Sets, &c.

Awls, Sewing, Common	\$ gross \$1.70—dis 35¢
Awls, Shouldered Peg	\$ gross \$2.45—dis 40¢ & 10¢
Awls, Patent Peg	\$ gross \$2.45—dis 40¢ & 10¢
Awls, Shouldered Brad	\$2.70 \$ gross—dis 35¢
Awls, Handled Brad	\$7.50 \$ gross—dis 45¢
Awls, Handled Scratch	\$7.50 \$ gross—dis 35¢ & 10¢
Awls, Socket Scratch	\$1.50 \$ doz—dis 25¢ & 30¢

Awl and Tool Sets.

Allen's Sets, Awls & Tools, No. 20	\$ doz \$10—dis 55¢ & 10¢
Tray's Ad Tool Hds., Nos. 1, 12; 2, 18; 3, 12; 4, 12	dis 25¢ & 25¢ & 10¢
Miller's Falls Ad. Tool Hds., Nos. 1, 12; 2, 18; 3, 12; 4, 12	dis 25¢ & 25¢ & 10¢
Henry's Combination Haft	\$ doz. 9¢
Brad Sets, No. 42, \$10.50, No. 43, \$12.50	dis 70¢ & 10¢ & 5¢
Brad Sets, Stanley's Excelsior, No. 1, \$7.50	dis 30¢ & 10¢
Brad Sets, Stanley's Excelsior, No. 2, \$4.00	dis 30¢ & 10¢
Brad Sets, Stanley's Excelsior, No. 3, \$5.50	dis 30¢ & 10¢

Axes.

Makers' and Special Brands—	
First quality	\$ doz. \$6.00 @ \$6.50
Others	\$ doz. \$5.50 @ \$5.75

Axle Grease.

Fraser's, in bulk	Keg \$ 4.40; Pail, \$ 1.50
Fraser's, in boxes	\$ gross \$9.50
Dixon's Everlasting, in bxs., \$ doz. 1.10; 2 doz. \$2	
Dixon's Everlasting, 10-b pails, each, 85¢	
Lower grades, special brands	\$ gro \$5.50 @ \$7

Axles.—

No. 1, 4¢ @ 4¢; No. 2, 5¢ @ 5¢	
No. 3, 10¢ @ 10¢	dis 50¢ & 55¢
No. 4, 15¢ @ 15¢	dis 60¢ & 10¢ & 70¢
National Wrought Steel Tubular Self-Oiling	
Standard Farm (1 to 5) and Special Farm (1 to 5)	dis 33¢
Less than 10 sets	dis 33¢ & 25¢
Over 10 sets	dis 33¢ & 25¢
XX Strong Truck (10 to 16)	dis 10¢
Less than 10 sets	dis 10¢ & 5¢
Over 10 sets	dis 10¢ & 5¢

Bag Holders.

Sprengle's Pat. \$ doz \$18	dis 60¢
Balances.—Spring Balances	dis 50¢
Common 24	\$ doz., \$1.50—dis 50¢
Chatillon's Spring Balances	dis 50¢
Chatillon's Circular Spring Balances	dis 60¢

Bells.

Light Brass	dis 70¢ & 10¢
Extra Heavy	dis 60¢ & 10¢
White Metal	dis 60¢ & 10¢ & 10¢
Silver Chime	dis 33¢ & 10¢
Globe (Coe's Patent)	dis 55¢ & 10¢ @ 35¢

Doors.

Gong, Abbe's	dis 33¢ & 10¢
Gong, Yankee	dis 45¢ & 10¢
Gong, Barton's	dis 40¢ & 10¢ @ 50¢
Gong, Taylor's	dis 25¢ & 10¢
Gong, Brooks'	dis 50¢ & 10¢ & 2¢
Gong, Cone's	dis 10¢
Gong, Connel's	dis 20¢ & 10¢
Lever, Sargent's	dis 60¢ & 10¢
Lever, Taylor's Bronzed or Plated	net
Lever, Taylor's Japanned	dis 25¢ & 10¢
Lever, R. E. & Co's	dis 50¢ & 10¢ & 2¢
Full, Brooks'	dis 50¢ & 10¢ & 2¢
Full, Westerns	dis 25¢ & 10¢

Cone.

Common Wrought	dis 60¢ & 10¢
Western	dis 20¢ & 10¢
Western, Sargent's list	dis 70¢ & 10¢
Kentucky "Star"	dis 20¢ & 10¢
Kentucky, Sargent's list	dis 70¢ & 10¢
Dodge, Genuine Kentucky, New list	dis 70¢ & 10¢
Texas Star	dis 50¢ & 10¢ @ 50¢ & 10¢ & 5¢
Call	dis 40¢ & 40¢ & 5¢
farm Bells	\$ 3.30 @ 3.40
Steel Alloy Church and School Bells	dis 40¢
Bellews.—Blacksmiths	dis 60¢ & 10¢ & 60¢
Molders'	dis 40¢ & 40¢ & 5¢
Hand Bellows	dis 40¢ & 10¢ @ 40¢

Belting, Rubber.

Common Standard	dis 7¢ & 10¢
Standard	dis 70¢ & 70¢ & 2¢
Extra	dis 60¢ & 5¢ @ 60¢
N. Y. & P. C. Standard	dis 40¢ & 40¢ & 5¢
N. Y. & P. C. Extra Standard	dis 50¢ & 10¢

Bench Stops.

Morrill's	\$ doz \$9—dis 50¢
Hutchins's	\$ doz \$5.00—dis 10¢ @ 10¢ & 10¢
Weston's, per doz No. 1, \$10; No. 2, \$9	dis 25¢ & 10¢ & 5¢
McGill's	\$ doz \$3—dis 10¢

Bits.

Augers and Bits.	
Bit Holders.	
Extension, Barber's	\$ doz \$15.00—dis 40¢ @ 40¢ & 10¢
Extension, Ives'	\$ doz \$20.00—dis 60¢ & 5¢ @ 60¢ & 10¢
Diagonal	\$ doz \$24.00—dis 40¢
Augers	\$ doz \$24.00—dis 40¢ & 5¢
Blind Augers.	
Domestic	\$ per doz \$3.00—dis 33¢
Excelsior	\$ doz \$10.00—dis 50¢ & 10¢ & 2¢
Washburn's Self-Locking	dis 20¢ @ 20¢ & 10¢

Blind Fasteners.

Mackrell's	\$ doz pairs \$1.00—dis 20¢ & 10¢
Van Sand's Screw Pattern	\$15 \$ gro—dis 60¢ & 10¢
Van Sand's Old Pattern	\$15 \$ gro—dis 55¢ & 10¢
Washburn's Old Pattern	\$ \$ gro, net
Merriman's	new list, net
Austin & Eddy No. 2008	\$ \$ gro, net
Security Gravity	\$ \$ gro, net

Blind Staples.

Barbed, 1/2 in. and larger	\$ d 7¢ @ 8¢ net
Barbed, 1/2 in.	\$ d 8¢ @ 9¢ net

Blocks.

Cleveland Block Co., Mal. Iron	dis 50¢
Novelty Tackle Blocks, Mal. Iron	dis 50¢

Bolts.

Door and Shutter—	
Cast Iron Barrel, Square, &c.	dis 70¢ @ 70¢ & 10¢
Cast Iron Shutter Bolts	dis 70¢ @ 70¢ & 10¢
Cast Iron Chain (Sargent's list)	dis 65¢ & 10¢
Ives' Patent Door Bolts	dis 50¢
Wrought Barrel	dis 70¢ @ 70¢ & 10¢
Wrought Square	dis 70¢ @ 70¢ & 10¢
Wrt Shutter, all Iron, Stanley's list	dis 60¢ & 10¢
Wrt Shutter, Brass Knob, Stanley's	dis 40¢ & 10¢
Wrought Shutter, Sargent's list	dis 55¢ & 10¢
Wrought Sunk Flush, Sargent's list	dis 55¢ & 10¢
Wrought sunk Flush, Stanley's list	dis 50¢ & 10¢
Wrought R. E. Flush, Com'n Stanley's list	dis 55¢ & 10¢

Carriage.

Com. list June 10, '84	dis 75¢ & 25¢ & 2¢
Genuine Eagle, list Oct. '84	dis 75¢ & 10¢
Phila. pattern, list Oct. 7, '84	dis 75¢ & 10¢ & 5¢ & 10¢
R. B. & W. old list	dis 70¢

Fire.

Common, list Feb. 28, 1883	dis 70¢
P. C. B. & N. Co., Empire, list Feb. 28, 1883	dis 70¢
P. C. B. & N. Co., Philadel., list Oct. '84	dis 82¢</

Wrought (Steel)—	
Fast Joint, Narrow.....	dis 70&10
Fast Joint, Lt. Narrow.....	dis 70&10
Fast Joint, Broad.....	dis 70&10
Loose Joint, Broad.....	dis 70&10
Table Butts, Back Flaps, &c.....	dis 70&10
Inside Blind, Regular.....	dis 70&10
Inside Blind, Light.....	dis 70&10
Loose Pin.....	dis 70&10
Bronzed Wrought Butts.....	dis 40&10 to 40&10&5

Callipers.—See Compasses.

Chalks, Toe	
Gautier.....	dis 54&10
Dewicks.....	dis 54&10

Can Openers.

Messengers' Comet.....	dis 35.00, dis 25
American.....	dis 35.00, dis 25
Duplex.....	dis 35.00, dis 25
Lyman's.....	dis 35.00, dis 25
No. 4, French.....	dis 35.00, dis 25
No. 5, Iron handle.....	dis 35.00, dis 25
Eureka.....	dis 35.00, dis 25
Sardine Scissors.....	dis 35.00, dis 25
Star.....	dis 35.00, dis 25
Sprague, No. 1, P. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	

World's Best, P. gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.	
Universal.....	dis 35.00, dis 35&5
Domestic.....	dis 35.00, dis 35&5
Champion.....	dis 35.00, dis 35&5

Cards.	
Horse and Curry.....	dis 10&10 to 10&10&10
Cotton.....	dis 10&10 to 10&10&10
Wool.....	dis 10&10 to 10&10&10

Carpet Stretchers.	
Cast Steel, Polished.....	dis 22.25
Cast Iron, Steel Points.....	dis 22.25
Socket.....	dis 22.25
Ballard's.....	dis 22.25

Carpet Sweepers.	
Bissell No. 5.....	dis 17.00
Bissell No. 7 New Drop Pan.....	dis 17.00
Bissell Grand.....	dis 17.00
Grand Rapids.....	dis 17.00
Crown Jewel.....	dis 17.00
Magic.....	dis 17.00

Jewel.....	dis 17.00
Improved Parlor Queen, Nickleled.....	dis 17.00
Improved Parlor Queen, Japanned.....	dis 17.00
Excelsior.....	dis 17.00
Garland.....	dis 17.00
Parlor Queen.....	dis 17.00
Housewife's Delight.....	dis 17.00
Queen, with band.....	dis 17.00
King.....	dis 17.00
Weed Improved.....	dis 17.00
Hub.....	dis 17.00
Cog Wheel.....	dis 17.00
Conqueror.....	dis 17.00
Easy.....	dis 17.00
Monarch.....	dis 17.00
Goshen.....	dis 17.00
Advance.....	dis 17.00
Ladies' Friend, No. 1, P. gross, \$15.00; No. 2, P. gross, \$15.00.	
American.....	dis 17.00
Grand Republic.....	dis 17.00

Cartridges.—See Ammunition.	
Casters.	
Bed.....	dis 55 to 55&5
Shallow Socket.....	dis 55 to 55&5
Deep Socket.....	dis 55 to 55&5
Yale Casters, list May, 1888.....	dis 30&10 to 30&10&5
Yale, Gem.....	dis 30&10 to 30&10&5
Martin's Patent (Patent).....	dis 30&10 to 30&10&5
Payson's Anti-friction.....	dis 30&10 to 30&10&5
"Giant" Truck Casters.....	dis 30&10 to 30&10&5
Stationary Truck Casters.....	dis 30&10 to 30&10&5

Cattle Leaders.	
Humason, Beckley & Co.'s.....	dis 70
Bargent's.....	dis 70
Hotchkiss.....	dis 70
Peck Stow & Wilcox.....	dis 70

Advance.....	doz \$1.00
Ladies' Friend, No. 1, P doz, \$15.00; No 2..	doz \$18.00
American	doz \$16.00
Grand Republic.....	doz \$15.00
	doz \$35.00

Hickory Firmer Chisel, assorted.....	gross 4.50
Hickory Firmer Chisel, large.....	gross 5.00
Apple Firmer Chisel, assorted.....	gross 6.00
Apple Firmer Chisel, large.....	gross 6.00
Socket Firmer Chisel, assorted.....	gross 3.00
Socket Framing Chisel, assorted.....	gross 5.00
J. B. Smith Co's Pat. File.....	dis 60
File, assorted.....	gross 2.75
Auger, assorted.....	gross 5.00
Auger, large, iron.....	gross 7.00
Patent Auger, Douglass.....	set \$1.25 net
Patent Auger, Swan's.....	set \$1.00 net
Hoe, Rake, Shovel, &c.....	dis 50 to 10

Cross Cut Saw Handles.....	dis 60
Atkins' No. 1 Loop, pair, 30# No. 3, 22# No. 2 and No. 4 Reversible, 22#.....	dis 60
Boynton's Loop Saw Handles.....	dis 60
Champion.....	dis 150

Hangers.	
Barn Door, old pattern.....	dis 60 to 10
Barn Door, New England.....	dis 60 to 10
Samson Steel Anti-Friction.....	dis 50
Orleans Steel.....	dis 50
Hamilton Wrought Wood Track.....	dis 50
U. S. Wood Track.....	dis 50
Champion.....	dis 60 to 10
Rider and Wooster, Medina Mfg. Co's list.....	dis 7
Climax Anti-Friction.....	dis 50
Climax Steel Anti-Friction.....	dis 50
Zenith for Wood Track.....	dis 50
Reed's Steel Arm.....	dis 50
Challenge, Barn Door.....	dis 50
Sterling Improved (Anti-Friction).....	dis 50 to 10
Victor, No. 1, 15; No. 2, 16.50; No. 3, 18.....	dis 50 to 10
Chertree.....	dis 50 to 10
Kidder's.....	dis 50 to 10
The "Iron".....	dis 60
Best Anti-Friction.....	dis 60
Duplex (Wood Track).....	dis 60
Terry's Patent.....	dis 60
Oronk's Patent.....	dis 60
Wood Track, Iron Clad.....	dis 50 to 10
Carrier Steel Anti-Friction.....	dis 50 to 10
Architect.....	dis 50 to 10
Eclipse.....	dis 50 to 10
Felix.....	dis 50 to 10
Richards.....	dis 50 to 10
Lane's Steel Anti-Friction.....	dis 50 to 10
The Ball Bearing Door Hanger.....	dis 50 to 10
Warner's Patent.....	dis 50 to 10
Stearns' Anti-Friction.....	dis 50 to 10
Stearns' Challenge.....	dis 50 to 10
Faultless.....	dis 50 to 10
American.....	dis 50 to 10
Rider & Wooster, No. 1, 62 1/2; No. 2, 75.....	dis 40
Paragon, Nos. 1, 2 and 3.....	dis 40 to 10
Paragon, Nos. 5, 6, 7 and 8.....	dis 40 to 10
Crescent.....	dis 60 to 10
Nickel, Cast Iron.....	dis 50
Nickel, Malleable Steel.....	dis 40
Scranton Anti-Friction Single Strap.....	dis 33 1/2
Scranton Anti-Friction Double Strap.....	dis 40
Universal Anti-Friction.....	dis 40
Wild West, 4 in. wheel, 15; 5 in. wheel, 21.....	dis 40 to 10
Star.....	dis 40 to 10
May.....	dis 50 to 10

Harness Snaps.—See Snaps.

Hatchets. —List Jan. 1, 1888.	
Isalah Blood.....	dis 35 to 40
Hunt's Shingling Lath and Claw.....	dis 40
Hunt's Broad.....	dis 40
Buffalo Hammer Co.....	dis 40 to 10
Hurd's.....	dis 40 to 10
Fayette R. Plumb.....	dis 40 to 10
Wm. Mann, Jr., & Co.....	dis 50 to 60
Underhill Edge Tool Co.....	dis 40 to 10
Underhill's Haines and Bright goods.....	dis 33 1/2
C. Hammond & Son.....	dis 40 to 10
Hammond.....	dis 40 to 10
Peck's.....	dis 40 to 10
Kelly's.....	dis 50 to 60
Sargent & Co.....	dis 40 to 10
Ten Eyck Edge Tool Co.....	dis 40 to 10
Collins, following list.....	dis 40 to 10
Shingling, Nos. 1, 2, 3.....	dis 40 to 10
Claw, Nos. 1, 2, 3.....	dis 40 to 10
Lathing, Nos. 1, 2, 3.....	dis 40 to 10

Hay Knives.

Lightning.....	Mfrs. price \$18, dis 25
Electric.....	dis 17 to 30
Gem.....	dis 18 to 30
Wadsworth.....	dis 18 to 30
Carter's Needle.....	dis 11 to 15
Heath's.....	dis 13 to 15

Hinges.

Wrought Iron Hinges.	
Strap and T.....	dis 70 to 10
Screw Hook and Strap.....	dis 30 to 10
Heavy Welded Hook.....	dis 30 to 10
Screw Hook and Eye.....	dis 30 to 10
Rolled Blind Hinges, Nos. 32 and 34.....	dis 50 to 10
Rolled Blind Hinges, Nos. 232 and 234.....	dis 55 to 10
Rolled Plate.....	dis 50 to 10
Rolled Raised.....	dis 70 to 10
Plate Hinges, 8, 10 and 12 in.....	dis 50 to 10
"Providence" over 12 in.....	dis 50 to 10

Spring Hinges.

Geer's Spring and Blank Butts.....	dis 40
Union Spring Hinge Co's list, March, 1886.....	dis 20
Acme and U. S.....	dis 30
Empire and Crown.....	dis 20
Hero and Monarch.....	dis 20
American, Gem, and Star, Japaned.....	dis 20
American, Gem, and Star, Bronzed.....	dis 20
Oxford, Bronze and Brass.....	dis 20
Barker's Double Acting.....	dis 20 to 10
Union Mfg. Co.....	dis 20
Bommer's.....	dis 30
Buckman's.....	dis 30
Chicago.....	dis 30

Gate Hinges.

Western.....	dis 44 to 55
N. E. Reversible.....	dis 70 to 10
Clark's, Nos. 1, 2, 3.....	dis 55 to 10
N. Y. State.....	dis 55 to 10
Automatic.....	dis 12 to 50
Common Sense.....	dis 45 to 50
Seymour's.....	dis 45 to 50
Shepard's.....	dis 60 to 10
Reed's Latch and Hinges.....	dis 50 to 10

Hand Hinges.

Parker.....	dis 75 to 2
Palmer.....	dis 50 to 10
Seymour.....	dis 70 to 2
Nicholson.....	dis 45 to 10
Huffer.....	dis 50 to 10
Clark's, Nos. 1, 3, 4 and 60.....	dis 75 to 10
Clark's Mortise Gravity.....	dis 50
Sargent's, Nos. 1, 3, 5, 11, 13.....	dis 75 to 10
Sargent's, No. 12.....	dis 75 to 10
Reading's Gravity.....	dis 75 to 10

Shepard's Noiseless Niagara, Buffalo, Champlow, Steamboat, Clark's Old Pattern and Clark's Tip Pattern.....	dis 75 to 10
Shepard's O. S., Lull & Porter.....	dis 75 to 10
Shepard's Acme, Lull & Porter.....	dis 75 to 10
Shepard's Queen City Reversible.....	dis 75
Clark's Lull & Porter, Nos. 9, 1, 1 1/2, 2, 2 1/2, 3.....	dis 75 to 10
Non's Automatic Blade Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....	dis 25 to 2

Hoops.

Garden, Mortar, &c.....	dis 65 to 5
Planter's, Cotton, &c.....	dis 65 to 5
Warren Hoe.....	dis 60
Magie.....	dis 40

Eye.

D. & H. Scovill.....	dis 20
Lane's Crescent Scovill Pattern.....	dis 45
Lane's Crescent Pattern.....	dis 45
Lane's Razor Blade, Scovill Pattern.....	dis 45
Sandusky Tool Co., S. & O. Pat.....	dis 60
Hubbard & Co.....	dis 60
Bas.....	dis 60
Grub.....	dis 60 to 10

How Rings and Ringers.

Will's Improved Ringers.....	dis 1.50
Will's Old Style Ringers.....	dis 3.00
Will's Tongs.....	dis 1.50
Will's Rings.....	dis 2.00
Perfect Rings.....	dis 1.75 to 2.00
Perfect Ringers.....	dis 2.50
Blair's Hog Ringers.....	dis 1.00
Blair's Hog Ringers.....	dis 1.00
Champion Ringers.....	dis 2.00
Champion Rings, Double.....	dis 2.25
Brown's Ringers.....	dis 2.00
Brown's Ringers.....	dis 1.25 to 1.30

Hoisting Apparatus.

"Moore's" Head Hoist, with Lock Brake.....	dis 70
"Moore's" Differential Pulley Block.....	dis 40
Energy Mfg. Co's.....	dis 25

Holders, File and Tool.

Ball Pat.....	dis 20
Nicholson File Holders.....	dis 20

Hollow Ware.

Stove Hollow Ware, Ground.....	dis 60 to 10
Stove Hollow Ware, Unground.....	dis 70 to 10
Enameled and Tinned Hollow Ware.....	dis 70 to 10
Kettles.....	dis 40 to 10
Oval Rollers, Saucepans & Gilt Pots.....	dis 40 to 10
Gray Enameled Ware.....	dis 50 to 10
Avate and Granite Ware.....	dis 50
Rustless Hollow Ware.....	dis 50 to 10
Galvanized Tea-Kettles.....	dis 50
Each.....	dis 50
Sliver Files—4 mo. or 6 1/2 each in 30 days.....	dis 40 to 10
Reed & Barton.....	dis 40 to 10
Meriden Britannia Co.....	dis 40 to 10
Simpson, Hall, Miller & Co.....	dis 40 to 10
Rogers & Brother.....	dis 40 to 10
Hartford Silver Plate Co.....	dis 40 to 10
William Rogers Mfg. Co.....	dis 40 to 10

Hooks.

Cast Iron.	
Bird Cage, Sargent's list.....	dis 60 to 10
Bird Cage, Reading.....	dis 60 to 10
Clothes Line, Sargent's list.....	dis 60 to 10
Clothes Line, Reading list.....	dis 60 to 10
Collins Sargent's list.....	dis 55 to 10
Harness, Reading list.....	dis 55 to 10
Coat and Hat, Sargent's list.....	dis 55 to 10
Coat and Hat, Reading.....	dis 55 to 10
Wrought Iron.	
Cotton.....	dis 50 to 10
Cotton Pat. T. & S. Mfg. Co.....	dis 50
Tassel and Picture T. & S. Mfg. Co.....	dis 50
Wrought Staples, Hooks, &c.....	dis 50 to 10
Bench Hooks.....	dis 50 to 10

Wire.

Wire Coat and Hat, Gem, list April, 1886.....	dis 45
Wire Coat and Hat, Miller, list April, 1886.....	dis 45
Indestructible Coat and Hat.....	dis 45
Wire Coat and Hat, Standard.....	dis 45
Belt.....	dis 75 to 10
Grass.....	dis 50 to 10
Bush.....	dis 50 to 10
Whitcomb-Palmer.....	dis 50 to 10
Hooks and Eyes—Malleable Iron.....	dis 70 to 10
Hooks and Eyes—Brass.....	dis 60 to 10
Fish Hooks, American.....	dis 50

Horse Nails.

Available.....	dis 25 to 10
Cutlery.....	dis 25 to 10
Essex.....	dis 25 to 10
Lyra.....	dis 25 to 10
Snowden.....	dis 25 to 10
Putnam.....	dis 25 to 10
Globe.....	dis 25 to 10
A. C. North.....	dis 25 to 10
C. B. K.....	dis 25 to 10
Champlain.....	dis 25 to 10
New Haven.....	dis 25 to 10
Saranac.....	dis 25 to 10
Champion.....	dis 25 to 10
Capwell.....	dis 25 to 10
Star.....	dis 25 to 10
Anchor.....	dis 25 to 10
Western.....	dis 25 to 10
Empire Bronze.....	dis 25 to 10

Horse Shoes.

Horse Shoes, competition.....	dis 75 to 10
Standard.....	dis 70 to 10
Extra.....	dis 60 to 10
N. Y. R. & P. Co. Para.....	dis 30 to 10
N. Y. R. & P. Co. Extra.....	dis 50
N. Y. R. & P. Co. Dundee.....	dis 60 to 10

Hooks.

Blair's Adjustable.....	dis 70 to 10
Blair's Adjustable Clipper.....	dis 70 to 10

Jack Screws.—See Screws.

Kettles.

Brass, 7 to 17 in.....	dis 50 to 10
Brass larger than 17 in.....	dis 50 to 10
Enameled and Tea Kettles.....	dis 50 to 10

Keys.

Lock Ass'n list Dec. 30, 1886.....	dis 50 to 10
Eagle, Cabinet, Truck and Padlock.....	dis 33 to 10
Hotchkiss' Brass Blank.....	dis 40
Hotchkiss' Copper and Tinned.....	dis 40
Hotchkiss' Padlock and Cabinet.....	dis 35
Ratchet Bed Keys.....	dis 40 to 10
Wollensak, Tinned.....	dis 50 to 10

Knife Sharpeners.

Parkin's Apprehend Handles.....	dis 40 to 10
Parkin's Rosewood or Cocobolo.....	dis 40 to 10
Wilson's Futcher Knives.....	dis 20 to 10
Ames' Butcher Knives.....	dis 20
Foster Bros., Butcher, &c.....	dis 40
Nichols' Butcher Knives.....	dis 40
Ames' Shoe Knives.....	dis 20 to 10
Ames' Bread Knives.....	dis 15 to 10
Brown's Shoe and Bread Knives.....	dis 20
Hay and Straw.....	dis 20
Table and Pocket.....	dis 20

Knobs.

Door Mineral.....	dis 65 to 10
Door Por. Jap'd.....	dis 75 to 10

Door Por. Por. Nickel.....	dis 20 to 2.25
Door Por. Plated, Nickel.....	dis 20 to 2.25
Drawer, Porcelain.....	dis 55 to 10
Hemacite Door Knobs, new list.....	dis 40 to 10
Yale & Towne Wood Knobs, list Dec. 1885.....	dis 40
Furniture Plain.....	dis 10
Furniture Wood Screws.....	dis 25 to 10
Base, Rubber Tip.....	dis 70 to 10
Picture, Judd's.....	dis 60 to 10
Picture, Sargent's.....	dis 70 to 10
Picture, Hemacite.....	dis 35 to 10
Shutter, Porcelain.....	dis 65 to 10
Shutter, Japanese.....	dis 60 to 10

Ladies.

Melting, Sargent's.....	dis 55 to 10
Melting, Reading.....	dis 35 to 10
Melting, Monroe's Patent.....	dis 40 to 10
Melting, P. S. & W.....	dis 35 to 10
Melting, Warner's.....	dis 30

Lawn Mowers.

Standard List.....	dis 50 to 10
Enterprise.....	dis 60 to 10

Lanterns.

Rebular, Plain, with Guards.....	dis 40 to 10
Rebular, Lift Wire, with Guards.....	dis 40 to 10
Rebular, Square Plain, with Guards.....	dis 40 to 10
Rebular, Sq. Lift Wire, with Guards.....	dis 40 to 10
Without Guards, 25¢ dozen less.....	dis 40 to 10
Police, small, \$6.00; Med. \$7.25; Large, \$8.75.....	dis 20 to 25

Lemon Squeezers.

Porcelain Lined, No. 1.....	dis 50 to 10
Food, No. 2.....	dis 35 to 10
Wood, Common.....	dis 10 to 1.75
Dunlap's Improved.....	dis 35 to 10
Jamies.....	dis 25 to 10
Jennings' "Star".....	dis 25 to 10
The "Hoss".....	dis 25 to 10
Dean's.....	dis 25 to 10
King's Giant.....	dis 50 to 10
Little.....	dis 40 to 10

Lines.

Cotton and Linen Fish, Draper's.....	dis 60
Draper's Chalk.....	dis 60
Draper's Mason's Linen, 84 ft., No. 1, 1.25; No. 2, 1.25; No. 3, 1.25; No. 4, 1.25; No. 5, 1.25.....	dis 25
Cotton Chalk.....	dis 55
Samson, Cotton, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.....	dis 10
Silver Lake, Braided, Nos. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.....	dis 25
Yarns' Linen, No. 3, 1.50; No. 4, 1.50; No. 5, 1.50.....	dis 25
Yarns' "Colonial" Cotton, No. 1, 1.50; No. 2, 1.50; No. 3, 1.50; No. 4, 1.50; No. 5, 1.50.....	dis 25
Wire Clothes, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.....	dis 25
Ventilator Cord, 3/4 in. Braided, White or Drab.....	dis 20
Cotton.....	dis 20

Locks, Padlocks, Cabinet Locks, &c.

List Dec. 30, '86, chad Feb. 2, '87.....	dis 50 to 10
Malory, Wheeler Co., list July, 1885.....	dis 50 to 10
Sargent & Co. list Aug. 1, 1885.....	dis 50 to 10
Reading Hardware Co. list Feb. 2, '88.....	dis 50 to 10
Livingston & Co.....	dis 70
Note.—Lower net prices often made.	
Perkins' Burglar Proof.....	dis 60 to 25
Plate.....	dis 33 to 25
F. Many's Extension Cylinder.....	dis 10 to 50
Barnes Mfg. Co.....	dis 40
Yale Corrugated Key.....	dis 33 to 4
Diets Flat Key.....	dis 30
L. & C. Round Key Latches.....	dis 30 to 10
L. & C. Flat Key Latches.....	dis 30 to 10
Romer's Night Latches.....	dis 15
Yale new list.....	dis 33
"Shepardson" or "U. S.".....	dis 35
"Felter" or "American".....	dis 40 to 10
Sed's N. Y. Hasp Lock.....	dis 25
Cabinet.....	dis 25

Knives, Gaylor Parker and List March, '84, revised.

Pennsylvania.....	dis 40	10	5
Nos.....	1	2	3
dos.....	\$24.00	28.00	30.00
Miles' Challenge, Nos. 1	2	3	4
dos.....	\$22.00	30.00	40.00
Home No. 1.....	dis 20	25	30
Draw Cut, Nos.....	2	3	4
dos.....	\$50.00	75.00	80.00
Beef Shavers (Enterprise Mfg. Co.).....	dis 20	25	30
Chadborn's Smoked Beef Cutters.....	dis 20	25	30
Winning Genuines.....	dis 20	25	30
Am. (2d quality), gro, 1 blade, 7; 2 blades, 12; 3	dis 20	25	30
blades, 18.....	dis 20	25	30
Lothrop's.....	dis 20	25	30
Smith's, dos, Single, \$2.00; Double, \$3.....	dis 20	25	30
Knapp & Cowles.....	dis 20	25	30
Buffalo Adjustable.....	dis 20	25	30
Stebbins' Genuines.....	dis 20	25	30
Stebbins' Tinned Ends.....	dis 20	25	30
Chase's Hard Metal.....	dis 20	25	30
Bush's.....	dis 20	25	30
Wood's.....	dis 20	25	30
Lee's.....	dis 20	25	30
Boas Nos.....	2	3	4
dos.....	\$7.00	8.00	9.00
Money Drawers, dos.....	\$18	\$20	\$25
Muzzies, Safety, dos.....	\$3	\$5	\$10
Nails.....	See Trade Report		
Wire Nails & Brads, list July 14, 87.....	dis 70	10	15
Wire Nails, Standard Penny, dos.....	\$2.00	\$2.70	\$3.00
Wall Nail, Curtis Hammer.....	dis 20	25	30
Giant, No. 1.....	dis 20	25	30
Pelican.....	dis 20	25	30
Boas.....	dis 20	25	30
Lightning.....	dis 20	25	30
Nail Sets, Square.....	dis 20	25	30
Round.....	dis 20	25	30
Cannon's Diamond Point.....	dis 20	25	30
Nut Crackers.....	dis 20	25	30
Table (Hudson & Beckley Mfg. Co.).....	dis 40	50	60
Blake's pattern.....	dis 20	25	30
Turner & Seymour Mfg. Co.....	dis 60	70	80
Nuts, off list Jan. 1, 1888.....	dis 60	70	80
Hot Pressed.....	dis 60	70	80
Cold Punched.....	dis 60	70	80
In lots less than 100 lb, add 1/4, 1 lb boxes add 1/2			
to list.....			
Government.....	dis 60	70	80
U. S. Navy.....	dis 60	70	80
NAVY.....	dis 60	70	80
Officers, Zinc and Tin.....	dis 60	70	80
Brass and Copper.....	dis 60	70	80
Aluminum, Improved, No. 1, \$3.00; No. 2,	dis 60	70	80
\$4.00; No. 3, \$4.40.....	dis 60	70	80
Aluminum, Old Pattern, same list.....	dis 60	70	80
Prior's Patent or "Paragon" Zinc.....	dis 60	70	80
Prior's Patent or "Paragon" Brass.....	dis 60	70	80
Olmstead's Tin and Zinc.....	dis 60	70	80
Olmstead's Brass and Copper.....	dis 60	70	80
Broughton's Zinc.....	dis 60	70	80
Broughton's Brass.....	dis 60	70	80
Packing, Steam.....	dis 60	70	80
Standard.....	dis 60	70	80
Extra.....	dis 60	70	80
N. Y. B. & P. Co., Standard.....	dis 60	70	80
N. Y. B. & P. Co., Empire.....	dis 60	70	80
N. Y. B. & P. Co., Salamander.....	dis 60	70	80
Jenkins' Standard.....	dis 60	70	80
American Packing.....	dis 60	70	80
Russia Packing.....	dis 60	70	80
Italian Packing.....	dis 60	70	80
Cotton Packing.....	dis 60	70	80
Jute.....	dis 60	70	80
Padlocks, See Locks.....	dis 60	70	80
Paints.....	dis 60	70	80
Galvanized Iron.....	dis 60	70	80
Quartz.....	dis 60	70	80
Hill's Light Weight, dos.....	\$2.75	\$3.00	\$3.25
Hill's Heavy Weight, dos.....	\$3.00	\$3.25	\$3.50
Whiting's.....	\$2.75	\$3.00	\$3.25
Sidney Shepard & Co.....	\$2.80	\$3.00	\$3.40
Iron Clad.....	\$2.75	\$3.00	\$3.25
Fire Buckets.....	\$2.75	\$3.25	\$3.50
Rockets, See Wall Buckets.....	dis 60	70	80
Indurated Fibre Ware.....	dis 60	70	80
Star Falls, 12 qt.....	dis 60	70	80
Fire Stable and Milk, 14 qt.....	dis 60	70	80
Fenice's Faber's Carpenters.....	dis 60	70	80
Faber's Round Gills.....	dis 60	70	80
Dixon's Lead.....	dis 60	70	80
Dixon's Lead.....	dis 60	70	80
Dixon's Carpenters.....	dis 60	70	80
Picks.....	dis 60	70	80
Railroad, 5 to 6, \$12.00; 6 to 7, \$13.00; 7 to 8, \$14.00; 8 to 9, \$15.00; 9 to 10, \$16.00; 10 to 11, \$17.00; 11 to 12, \$18.00; 12 to 13, \$19.00; 13 to 14, \$20.00; 14 to 15, \$21.00; 15 to 16, \$22.00; 16 to 17, \$23.00; 17 to 18, \$24.00; 18 to 19, \$25.00; 19 to 20, \$26.00; 20 to 21, \$27.00; 21 to 22, \$28.00; 22 to 23, \$29.00; 23 to 24, \$30.00; 24 to 25, \$31.00; 25 to 26, \$32.00; 26 to 27, \$33.00; 27 to 28, \$34.00; 28 to 29, \$35.00; 29 to 30, \$36.00; 30 to 31, \$37.00; 31 to 32, \$38.00; 32 to 33, \$39.00; 33 to 34, \$40.00; 34 to 35, \$41.00; 35 to 36, \$42.00; 36 to 37, \$43.00; 37 to 38, \$44.00; 38 to 39, \$45.00; 39 to 40, \$46.00; 40 to 41, \$47.00; 41 to 42, \$48.00; 42 to 43, \$49.00; 43 to 44, \$50.00; 44 to 45, \$51.00; 45 to 46, \$52.00; 46 to 47, \$53.00; 47 to 48, \$54.00; 48 to 49, \$55.00; 49 to 50, \$56.00; 50 to 51, \$57.00; 51 to 52, \$58.00; 52 to 53, \$59.00; 53 to 54, \$60.00; 54 to 55, \$61.00; 55 to 56, \$62.00; 56 to 57, \$63.00; 57 to 58, \$64.00; 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Machine—	
Flat Head, Iron.....	dis 55
Round Head, Iron.....	dis 50
Bench and Hand—	
Bench, Iron.....	dis 55 to 60
Bench, Wood, Beech.....	dis 22 to 25
Bench, Wood, Hickory.....	dis 25 to 30
Hand, Wood.....	dis 25 to 30
Lat, Blunt Point.....	dis 75 to 80
Coach and Lag, Glimet Point.....	dis 75 to 80
Hand Rail, Sargent's.....	dis 65 to 70
Hand Rail, Humason, Beckley & Co.'s.....	dis 70 to 75
Hand Rail, Am. Screw Co.....	dis 75
Jack Screws, Millers Falls list.....	dis 50 to 55
Jack Screws, P. S. & W.....	dis 35
Jack Screws, Sargent.....	dis 60 to 65
Jack Screws, Sterns.....	dis 40 to 45
Scroll Saws—	
Lester, complete.....	dis 20
Roxers, complete.....	dis 25
Barnes' Builders' and Cabinet Makers', \$15.....	dis 25
Barnes' Scroll Saw Blades.....	dis 35
Scythe Snaths—	
American (Cast) Iron.....	dis 75 to 80
Pruning.....	See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....	dis 37 to 40
Timmers.....	dis 20 to 25
Hermour's, List, Dec. 1881.....	dis 60 to 65
Heinsch's, List, Dec. 1881.....	dis 60 to 65
Heinsch's Tailor's Shears.....	dis 38 to 40
First quality C. S. Trimmers.....	dis 80 to 85
Second quality C. S. Trimmers.....	dis 80 to 85
Acme Cast Shears.....	dis 10 to 15
Diamond Cast Shears.....	dis 10 to 15
Clippers.....	dis 10 to 15
Victor Cast Shears.....	dis 75 to 80
Howe Bros. & Hubert, Solid Forged Steel.....	dis 40
Cleveland Machine Co., Solid Steel Forged.....	dis 70
Clausen Shear Co., Japaned.....	dis 70
Clausen Shear Co., Nickeled, same list.....	dis 80
Shavers—	
H. W. & Co., list July, 1888.....	dis 50 to 55
R. & E. list, Dec. 18, 1888.....	dis 55 to 60
Corbin's list.....	dis 60 to 65
Patent Roller.....	dis 60 to 65
Patent Roller, Hatfield's.....	dis 75
Russell's Anti-Friction, list Dec. 18, 1888.....	dis 60 to 65
Moore's Anti-Friction.....	dis 60
Shaving Shaver—	
R. & E. list Dec. 18, 1888.....	dis 60 to 65
Sargent's list.....	dis 60 to 65
Reading list.....	dis 60 to 65
Ship Tools—	
L. & J. White.....	dis 20 to 25
Albertson Mfg. Co.....	dis 25
Shoes, Horse, Mule, &c.	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—Add \$1 per keg to above prices.	
Oz, Wrought—	
Ton lots.....	\$ 2 1/2
1000 lb lots.....	\$ 2 1/2
500 lb lots.....	\$ 2 1/2
Shot.—Eastern prices, 2¢ off, cash, 5 days.....	\$1.10
Drop, 5 bag, 25 lb.....	\$1.20
Drop, 5 bag, 50 lb.....	\$1.40
Buck and Chilled, 5 bag.....	\$1.40
Buck and Chilled, 5 bag.....	\$1.40
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1888.....	dis 20
NOTE.—Jobbers frequently give 5 to 7% extra on above.	
Griffin's Black Iron.....	dis 50 to 55
Griffin's C. S. Spades.....	dis 60 to 65
Griffin's Solid Cast Steel R. R. Goods.....	dis 20
Old Colony (Sanford Fork & Tool Co.).....	dis 20
St. Louis Shovel Co.....	dis 20 to 25
Hussey, Bluns & Co.....	dis 15 to 20
Hubbard & Co.....	dis 20 to 25
Lehigh Mfg. Co.....	dis 60 to 65
Payne Pettibone & Son, list January, 1888.....	dis 30
Remington's (Lowman's Patent).....	dis 30 to 35
Rowland's, Black Iron.....	dis 50 to 55
Rowland's, Steel.....	dis 60 to 65
Shovels and Tones—	
Iron Head.....	dis 60 to 65
Brass Head.....	dis 60 to 65
Skeins, Thimble—	
Western list.....	dis 75 to 80
Columbus Wrt. Steel, list Nov. 1, 1887.....	dis 20
Coldbrookdale Iron Co.....	dis 50 to 55
Utica P. S. T. Skeins.....	dis 60
Utica Turned and Fitted.....	dis 35
Sieves—	
Bundalo Metallic, S. S. & Co., new list.....	dis 50 to 55
Barter Flour Sifters.....	dis 20 to 25
Smith's Adjustable Sifters.....	dis 20 to 25
Smith's Adjustable Milk Strainer.....	dis 20 to 25
Smith's Adjustable F. & C. Strainer.....	dis 20 to 25
Steeves, Wooden Sifters.....	dis 10 to 15
Mesh 15, Nested, 5 doz.....	\$ 7.00
Mesh 20, Nested, 5 doz.....	\$ 8.00
Mesh 30, Nested, 5 doz.....	\$ 10.00
Mesh 40, Nested, 5 doz.....	\$ 11.00
Mesh 50, Nested, 5 doz.....	\$ 12.00
Mesh 60, Nested, 5 doz.....	\$ 13.00
Mesh 70, Nested, 5 doz.....	\$ 14.00
Mesh 80, Nested, 5 doz.....	\$ 15.00
Mesh 90, Nested, 5 doz.....	\$ 16.00
Mesh 100, Nested, 5 doz.....	\$ 17.00
Mesh 120, Nested, 5 doz.....	\$ 18.00
Mesh 140, Nested, 5 doz.....	\$ 19.00
Mesh 160, Nested, 5 doz.....	\$ 20.00
Mesh 180, Nested, 5 doz.....	\$ 21.00
Mesh 200, Nested, 5 doz.....	\$ 22.00
Mesh 220, Nested, 5 doz.....	\$ 23.00
Mesh 240, Nested, 5 doz.....	\$ 24.00
Mesh 260, Nested, 5 doz.....	\$ 25.00
Mesh 280, Nested, 5 doz.....	\$ 26.00
Mesh 300, Nested, 5 doz.....	\$ 27.00
Mesh 320, Nested, 5 doz.....	\$ 28.00
Mesh 340, Nested, 5 doz.....	\$ 29.00
Mesh 360, Nested, 5 doz.....	\$ 30.00
Mesh 380, Nested, 5 doz.....	\$ 31.00
Mesh 400, Nested, 5 doz.....	\$ 32.00
Mesh 420, Nested, 5 doz.....	\$ 33.00
Mesh 440, Nested, 5 doz.....	\$ 34.00
Mesh 460, Nested, 5 doz.....	\$ 35.00
Mesh 480, Nested, 5 doz.....	\$ 36.00
Mesh 500, Nested, 5 doz.....	\$ 37.00
Mesh 520, Nested, 5 doz.....	\$ 38.00
Mesh 540, Nested, 5 doz.....	\$ 39.00
Mesh 560, Nested, 5 doz.....	\$ 40.00
Mesh 580, Nested, 5 doz.....	\$ 41.00
Mesh 600, Nested, 5 doz.....	\$ 42.00
Mesh 620, Nested, 5 doz.....	\$ 43.00
Mesh 640, Nested, 5 doz.....	\$ 44.00
Mesh 660, Nested, 5 doz.....	\$ 45.00
Mesh 680, Nested, 5 doz.....	\$ 46.00
Mesh 700, Nested, 5 doz.....	\$ 47.00
Mesh 720, Nested, 5 doz.....	\$ 48.00
Mesh 740, Nested, 5 doz.....	\$ 49.00
Mesh 760, Nested, 5 doz.....	\$ 50.00
Mesh 780, Nested, 5 doz.....	\$ 51.00
Mesh 800, Nested, 5 doz.....	\$ 52.00
Mesh 820, Nested, 5 doz.....	\$ 53.00
Mesh 840, Nested, 5 doz.....	\$ 54.00
Mesh 860, Nested, 5 doz.....	\$ 55.00
Mesh 880, Nested, 5 doz.....	\$ 56.00
Mesh 900, Nested, 5 doz.....	\$ 57.00
Mesh 920, Nested, 5 doz.....	\$ 58.00
Mesh 940, Nested, 5 doz.....	\$ 59.00
Mesh 960, Nested, 5 doz.....	\$ 60.00
Mesh 980, Nested, 5 doz.....	\$ 61.00
Mesh 1000, Nested, 5 doz.....	\$ 62.00
Mesh 1020, Nested, 5 doz.....	\$ 63.00
Mesh 1040, Nested, 5 doz.....	\$ 64.00
Mesh 1060, Nested, 5 doz.....	\$ 65.00
Mesh 1080, Nested, 5 doz.....	\$ 66.00
Mesh 1100, Nested, 5 doz.....	\$ 67.00
Mesh 1120, Nested, 5 doz.....	\$ 68.00
Mesh 1140, Nested, 5 doz.....	\$ 69.00
Mesh 1160, Nested, 5 doz.....	\$ 70.00
Mesh 1180, Nested, 5 doz.....	\$ 71.00
Mesh 1200, Nested, 5 doz.....	\$ 72.00
Mesh 1220, Nested, 5 doz.....	\$ 73.00
Mesh 1240, Nested, 5 doz.....	\$ 74.00
Mesh 1260, Nested, 5 doz.....	\$ 75.00
Mesh 1280, Nested, 5 doz.....	\$ 76.00
Mesh 1300, Nested, 5 doz.....	\$ 77.00
Mesh 1320, Nested, 5 doz.....	\$ 78.00
Mesh 1340, Nested, 5 doz.....	\$ 79.00
Mesh 1360, Nested, 5 doz.....	\$ 80.00
Mesh 1380, Nested, 5 doz.....	\$ 81.00
Mesh 1400, Nested, 5 doz.....	\$ 82.00
Mesh 1420, Nested, 5 doz.....	\$ 83.00
Mesh 1440, Nested, 5 doz.....	\$ 84.00
Mesh 1460, Nested, 5 doz.....	\$ 85.00
Mesh 1480, Nested, 5 doz.....	\$ 86.00
Mesh 1500, Nested, 5 doz.....	\$ 87.00
Mesh 1520, Nested, 5 doz.....	\$ 88.00
Mesh 1540, Nested, 5 doz.....	\$ 89.00
Mesh 1560, Nested, 5 doz.....	\$ 90.00
Mesh 1580, Nested, 5 doz.....	\$ 91.00
Mesh 1600, Nested, 5 doz.....	\$ 92.00
Mesh 1620, Nested, 5 doz.....	\$ 93.00
Mesh 1640, Nested, 5 doz.....	\$ 94.00
Mesh 1660, Nested, 5 doz.....	\$ 95.00
Mesh 1680, Nested, 5 doz.....	\$ 96.00
Mesh 1700, Nested, 5 doz.....	\$ 97.00
Mesh 1720, Nested, 5 doz.....	\$ 98.00
Mesh 1740, Nested, 5 doz.....	\$ 99.00
Mesh 1760, Nested, 5 doz.....	\$ 100.00
Mesh 1780, Nested, 5 doz.....	\$ 101.00
Mesh 1800, Nested, 5 doz.....	\$ 102.00
Mesh 1820, Nested, 5 doz.....	\$ 103.00
Mesh 1840, Nested, 5 doz.....	\$ 104.00
Mesh 1860, Nested, 5 doz.....	\$ 105.00
Mesh 1880, Nested, 5 doz.....	\$ 106.00
Mesh 1900, Nested, 5 doz.....	\$ 107.00
Mesh 1920, Nested, 5 doz.....	\$ 108.00
Mesh 1940, Nested, 5 doz.....	\$ 109.00
Mesh 1960, Nested, 5 doz.....	\$ 110.00
Mesh 1980, Nested, 5 doz.....	\$ 111.00
Mesh 2000, Nested, 5 doz.....	\$ 112.00
Mesh 2020, Nested, 5 doz.....	\$ 113.00
Mesh 2040, Nested, 5 doz.....	\$ 114.00
Mesh 2060, Nested, 5 doz.....	\$ 115.00
Mesh 2080, Nested, 5 doz.....	\$ 116.00
Mesh 2100, Nested, 5 doz.....	\$ 117.00
Mesh 2120, Nested, 5 doz.....	\$ 118.00
Mesh 2140, Nested, 5 doz.....	\$ 119.00
Mesh 2160, Nested, 5 doz.....	\$ 120.00
Mesh 2180, Nested, 5 doz.....	\$ 121.00
Mesh 2200, Nested, 5 doz.....	\$ 122.00
Mesh 2220, Nested, 5 doz.....	\$ 123.00
Mesh 2240, Nested, 5 doz.....	\$ 124.00
Mesh 2260, Nested, 5 doz.....	\$ 125.00
Mesh 2280, Nested, 5 doz.....	\$ 126.00
Mesh 2300, Nested, 5 doz.....	\$ 127.00
Mesh 2320, Nested, 5 doz.....	\$ 128.00
Mesh 2340, Nested, 5 doz.....	\$ 129.00
Mesh 2360, Nested, 5 doz.....	\$ 130.00
Mesh 2380, Nested, 5 doz.....	\$ 131.00
Mesh 2400, Nested, 5 doz.....	\$ 132.00
Mesh 2420, Nested, 5 doz.....	\$ 133.00
Mesh 2440, Nested, 5 doz.....	\$ 134.00
Mesh 2460, Nested, 5 doz.....	\$ 135.00
Mesh 2480, Nested, 5 doz.....	\$ 136.00
Mesh 2500, Nested, 5 doz.....	\$ 137.00
Mesh 2520, Nested, 5 doz.....	\$ 138.00
Mesh 2540, Nested, 5 doz.....	\$ 139.00
Mesh 2560, Nested, 5 doz.....	\$ 140.00
Mesh 2580, Nested, 5 doz.....	\$ 141.00
Mesh 2600, Nested, 5 doz.....	\$ 142.00
Mesh 2620, Nested, 5 doz.....	\$ 143.00
Mesh 2640, Nested, 5 doz.....	\$ 144.00
Mesh 2660, Nested, 5 doz.....	\$ 145.00
Mesh 2680, Nested, 5 doz.....	\$ 146.00
Mesh 2700, Nested, 5 doz.....	\$ 147.00
Mesh 2720, Nested, 5 doz.....	\$ 148.00
Mesh 2740, Nested, 5 doz.....	\$ 149.00
Mesh 2760, Nested, 5 doz.....	\$ 150.00
Mesh 2780, Nested, 5 doz.....	\$ 151.00
Mesh 2800, Nested, 5 doz.....	\$ 152.00
Mesh 2820, Nested, 5 doz.....	\$ 153.00
Mesh 2840, Nested, 5 doz.....	\$ 154.00
Mesh 2860, Nested, 5 doz.....	\$ 155.00
Mesh 2880, Nested, 5 doz.....	\$ 156.00
Mesh 2900, Nested, 5 doz.....	\$ 157.00
Mesh 2920, Nested, 5 doz.....	\$ 158.00
Mesh 2940, Nested, 5 doz.....	\$ 159.00
Mesh 2960, Nested, 5 doz.....	\$ 160.00
Mesh 2980, Nested, 5 doz.....	\$ 161.00
Mesh 3000, Nested, 5 doz.....	\$ 162.00
Mesh 3020, Nested, 5 doz.....	\$ 163.00
Mesh 3040, Nested, 5 doz.....	\$ 164.00
Mesh 3060, Nested, 5 doz.....	\$ 165.00
Mesh 3080, Nested, 5 doz.....	\$ 166.00
Mesh 3100, Nested, 5 doz.....	\$ 167.00
Mesh 3120, Nested, 5 doz.....	\$ 168.00
Mesh 3140, Nested, 5 doz.....	\$ 169.00
Mesh 3160, Nested, 5 doz.....	\$ 170.00
Mesh 3180, Nested, 5 doz.....	\$ 171.00
Mesh 3200, Nested, 5 doz.....	\$ 172.00
Mesh 3220, Nested, 5 doz.....	\$ 173.00
Mesh 3240, Nested, 5 doz.....	\$ 174.00
Mesh 3260, Nested, 5 doz.....	\$ 175.00
Mesh 3280, Nested, 5 doz.....	\$ 176.00
Mesh 3300, Nested, 5 doz.....	\$ 177.00
Mesh 3320, Nested, 5 doz.....	\$ 178.00
Mesh 3340, Nested, 5 doz.....	\$ 179.00
Mesh 3360, Nested, 5 doz.....	\$ 180.00
Mesh 3380, Nested, 5 doz.....	\$ 181.00
Mesh 3400, Nested, 5 doz.....	\$ 182.00
Mesh 3420, Nested, 5 doz.....	\$ 183.00
Mesh 3440, Nested, 5 doz.....	\$ 184.00
Mesh 3460, Nested, 5 doz.....	\$ 185.00
Mesh 3480, Nested, 5 doz.....	\$ 186.00
Mesh 3500, Nested, 5 doz.....	\$ 187.00
Mesh 3520, Nested, 5 doz.....	\$ 188.00
Mesh 3540, Nested, 5 doz.....	\$ 189.00
Mesh 3560, Nested, 5 doz.....	\$ 190.00
Mesh 3580, Nested, 5 doz.....	\$ 191.00
Mesh 3600, Nested, 5 doz.....	\$ 192.00
Mesh 3620, Nested, 5 doz.....	\$ 193.00
Mesh 3640, Nested, 5 doz.....	\$ 194.00
Mesh 3660, Nested, 5 doz.....	\$ 195.00
Mesh 3680, Nested, 5 doz.....	\$ 196.00
Mesh 3700, Nested, 5 doz.....	\$ 197.00
Mesh 3720, Nested, 5 doz.....	\$ 198.00
Mesh 3740, Nested, 5 doz.....	\$ 199.00
Mesh 3760, Nested, 5 doz.....	\$ 200.00
Mesh 3780, Nested, 5 doz.....	\$ 201.00
Mesh 3800, Nested, 5 doz.....	\$ 202.00
Mesh 3820, Nested, 5 doz.....	\$ 203.00
Mesh 3840, Nested, 5 doz.....	\$ 204.00
Mesh 3860, Nested, 5 doz.....	\$ 205.00
Mesh 3880, Nested, 5 doz.....	\$ 206.00
Mesh 3900, Nested, 5 doz.....	\$ 207.00
Mesh 3920, Nested, 5 doz.....	\$ 208.00
Mesh 3940, Nested, 5 doz.....	\$ 209.00
Mesh 3960, Nested, 5 doz.....	\$ 210.00
Mesh 3980, Nested, 5 doz.....	\$ 211.00
Mesh 4000, Nested, 5 doz.....	\$ 212.00
Mesh 4020, Nested, 5 doz.....	\$ 213.00
Mesh 4040, Nested, 5 doz.....	\$ 214.00
Mesh 4060, Nested, 5 doz.....	\$ 215.00
Mesh 4080, Nested, 5 doz.....	\$ 216.00
Mesh 4100, Nested, 5 doz.....	\$ 217.00
Mesh 4120, Nested, 5 doz.....	\$ 218.00
Mesh 4140, Nested, 5 doz.....	\$ 219.00
Mesh 4160, Nested, 5 doz.....	\$ 220.00
Mesh 4180, Nested, 5 doz.....	\$ 221.00
Mesh 4200, Nested, 5 doz.....	\$ 222.00
Mesh 4220, Nested, 5 doz.....	\$ 223.00
Mesh 4240, Nested, 5 doz.....	\$ 224.00
Mesh 4260, Nested, 5 doz.....	\$ 225.00
Mesh 4280, Nested, 5 doz.....	\$ 226.00
Mesh 4300, Nested, 5 doz.....	\$ 227.00
Mesh 4320, Nested, 5 doz.....	\$ 228.00
Mesh 4340, Nested, 5 doz.....	\$ 229.00
Mesh 4360, Nested, 5 doz.....	\$ 230.00
Mesh 4380, Nested, 5 doz.....	\$ 231.00
Mesh 4400, Nested, 5 doz.....	\$ 232.00
Mesh 4420, Nested, 5 doz.....	\$ 233.00
Mesh 4440, Nested, 5 doz.....	\$ 234.00
Mesh 4460, Nested, 5 doz.....	\$ 235.00
Mesh 4480, Nested, 5 doz.....	\$ 236.00
Mesh 4500, Nested, 5 doz.....	\$ 237.00
Mesh 4520, Nested, 5 doz.....	\$ 238.00
Mesh 4540, Nested, 5 doz.....	\$ 239.00
Mesh 4560, Nested, 5 doz.....	\$ 240.00
Mesh 4580, Nested, 5 doz.....	\$ 241.00
Mesh 4600, Nested, 5 doz.....	\$ 242.00
Mesh 4620, Nested, 5 doz.....	\$ 243.00
Mesh 4640, Nested, 5 doz.....	\$ 244.00
Mesh 4660, Nested, 5 doz.....	\$ 245.00
Mesh 4680, Nested, 5 doz.....	\$ 246.00
Mesh 4700, Nested, 5 doz.....	\$ 247.00
Mesh 4720, Nested, 5 doz.....	\$ 248.00
Mesh 4740, Nested, 5 doz.....	\$ 249.00
Mesh 4760, Nested, 5 doz.....	\$ 250.00
Mesh 4780, Nested, 5 doz.....	\$ 251.00
Mesh 4800, Nested, 5 doz.....	\$ 252.00
Mesh 4820, Nested, 5 doz.....	\$ 253.00
Mesh 4840, Nested, 5 doz.....	\$ 254.00
Mesh 4860, Nested, 5 doz.....	\$ 255.00
Mesh 4880, Nested, 5 doz.....	\$ 256.00
Mesh 4900, Nested, 5 doz.....	\$ 257.00
Mesh 4920, Nested, 5 doz.....	\$ 258.00
Mesh 4940, Nested, 5 doz.....	\$ 259.00
Mesh 4960, Nested, 5 doz.....	\$ 260.00
Mesh 4980, Nested, 5 doz.....	\$ 261.00
Mesh 5000, Nested, 5 doz.....	\$ 262.00
Mesh 5020, Nested, 5 doz.....	\$ 263.00
Mesh 5040, Nested, 5 doz.....	\$ 264.00
Mesh 5060, Nested, 5 doz.....	\$ 265.00
Mesh 5080, Nested, 5 doz.....	\$ 266.00
Mesh 5100, Nested, 5 doz.....	\$ 267.00
Mesh 5120, Nested, 5 doz.....	\$ 268.00
Mesh 5140, Nested, 5 doz.....	\$ 269.

